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Aristotle's Sluggish Earth, Part I: Problematics of the *De Caelo*

by Benedict M. Ashley, O.P.

THE REASONS [of the seventeenth century scientists who resisted the Copernican system] are typified in the criticism of Tycho Brahe (born three years after Copernicus' death) who expressed himself as unable to accept the heliocentric system because the earth is too sluggish to move; because the consequences which may be deduced from such a movement could not be observed; and moreover, the whole doctrine is contrary to scripture.[1]

The transition from the Aristotelian to the Galilean epoch is of immense interest to all concerned with foundational research in natural science. Formerly this transition was pictured as the primordial dawn of genuine science after the chaotic night of superstition. Then Duhem pointed out that it was nothing but a particular example of the normal process by which every scientific hypothesis must yield to its own offspring, some new hypothesis more perfectly accounting for the facts.

Certain philosophers prefer to think that this transition represents the emergence into rightful majority of a discipline formerly kept in tutelage, the declaration of independence of "science" from "philosophy." Others see it rather as a passage from one possible view concerning the aim and method of the study of nature to another alternate and competing view. Finally there are those who argue that this alternation of views is but another round in a complementary rivalry, in which of several valid approaches to nature each seeks a fair hearing.

I propose in the following pages to consider these alternative interpretations of this historic crisis in the context of an

[1] W. P. D. Wightman, *The Growth of Scientific Ideas* (Yale, 1951) p. 45.

analysis of the *De Caelo* of Aristotle, the work in which occurs the famous argument for a stationary earth which caused Tycho Brahe, the judges of Galileo, and other conservatives to hesitate before the theory of Copernicus.

1. "Common Sense" and Science

The discovery of the motion of the earth and the invention of non-Euclidean geometry have frequently been cited as dramatic proof that "common sense" is unreliable and must be radically corrected by the use of the scientific method. The Aristotelian system is pointed out as the classic monument which marks the grave of this discredited common sense. Recently an author of positivistic learnings has emphasized that the Aristotelian notion of science, in contradistinction to post-Galilean views, involved the fatal "evidence postulate."

> If all scientific knowledge is acquired by logical inference starting from a certain number of immediate irreducible principles, inevitably the question arises: whence do we obtain these principles; in what manner may we account for our possessing and using them?
>
> This question has been dealt with already by Aristotle himself. In his opinion we obtain the principles by way of an intuitive vision. This intuitive vision of the principles originates from induction on the basis of sense perception. . . .
>
> According to this doctrine the principles of science need not be detected by way of intentional systematic research; a summary inspection of perceptible phenomena is sufficient. Knowledge of the principles is no monopoly of the philosopher; it is proper to any man. All that philosophers have to do is to test and sift current opinions concerning the principles. This accounts for the important role which doxography, the description of the different opinions on a given subject, has always played in peripatetic science.[2]

[2] E. W. Beth, "Critical Epochs in the Development of the Theory of Science," *British Journal for the Philosophy of Science* I (1950) 30 ff. On p. 28, Beth lists the postulates which he believes are implied in the Aristotelian theory of science.

We should add that not only was Aristotle convinced that a science of nature must be founded in a common sense knowledge of nature, but that he took this position after a careful consideration of the alternative. In the Academy in which he was educated it was a commonplace that common sense ("opinion") had to be judged and corrected by "science."[3] Aristotle had seen where this view led, namely to the denial that the world of nature can be an object of science in its own right. Common sense knowledge arises immediately and spontaneously from our primary experience of the world. If it is untrustworthy, then how defend the mediate, reflexive type of knowledge acquired by "intentional systematic research?" Will we correct common sense by the "scientific facts?" "Scientific facts" are distinguished from those of common sense because they are selected in view of some theory. How then can this theory itself be justified? Aristotle could not accept the Platonic recourse to a transcendental knowledge acquired from vision of the Ideas. It is doubtful that he would have been any better pleased by the modern recourse to some "principle of simplicity" or a merely pragmatic test. All such views require an *a priori* element in knowledge; nor do they render nature intelligible in its own terms, but only fit it to a pre-conceived pattern.

Indeed Aristotle retained the essential distinction between "science" and "opinion," but in the sense that "science" is virtually contained in "opinion." Science is an extension and clarification of what is already achieved in a genuine although confused and implicit fashion in common sense. Aristotle's determination to reconcile science with the views of the man in the street is, therefore, no evidence that he underrated the

[3] See L.-M. Régis, O. P., *L'opinion selon Aristote* (Ottawa, 1935); also R. Garrigou-Lagrange, O. P., *Le Sens Commun* 4th ed. (Paris, 1936); and P. J. Jacoby, "*Common Sense*" *in Epistemology* (Dissertation, University of Notre Dame, Notre Dame, Ind., 1942).

specialized effort required to develop a science. It only shows his ambition to build a science of nature free from the *a priori*.

Similarly the concern of the peripatetics for doxographical research shows that they fully realized that common sense does not furnish the grounds of science until it has been rigorously analyzed and clarified.[4] The conflicts and paradoxes of pre-Socratic physics made Aristotle very keenly aware that the common sense thinker quickly falls into error if he attempts to extend his knowledge without first carefully analyzing his point of departure. The first task in constructing a science is to separate from the confused whole of common sense knowledge those truths which are strictly primary, immediate, and universal. Made explicit and accurately stated, such truths are no longer mere common sense: they are *precise* and capable of serving as principles of rigorous demonstration, that is, of science.

In the realm of the study of nature what are these truths? Aristotle did not attempt an exhaustive list, but in the *Physics* he proposes the following:

A. *Evident principles requiring no demonstration*:

1. There exist a number of changeable, sensible things, differing from each other both in number and in kind.[5]
2. Every changeable thing is under one aspect actually of a certain kind, and under another potentially other than it is.[6]
3. At least in some cases we can distinguish between changes that are produced artificially (by deliberate action), those that are produced by chance, and those that are produced by natural processes.[7]

Aristotle believed that these propositions are manifestly true from all our experience with the physical world. Furthermore

[4] See W. Jaeger, *Aristotle, Fundamentals of His Development* 2d ed. (Oxford, 1948) 1, pp. 11 ff.; 13, pp. 324 ff.

[5] *Physics*, I, 2, 185a 1 ff.: a refutation of the Eleatics.

[6] *Ibid.*, I, 7, 189b 1 ff.

[7] *Ibid.*, II, 1, 192b 1 ff.

he attempted to show that if they are denied, then a science of nature becomes impossible, since this denial leads inevitably to monism, immobilism, or pure determinism.

B. *General conclusions which are demonstrable and which serve as principles in the detailed branches of science*:

1. Only by their changes or stable states which natural things exhibit *regularly* do we know their natures.[8]
2. A physical thing is an agent by reason of its actuality and a patient by reason of its potentiality.[9]
3. Every naturally changing thing (except the universe as a whole) is measured by a natural time and place, i. e., is in contact with a special environment and has processes measured by some most uniform change.[10]
4. There are three types of natural change, that of place, of quantity, and of quality, of which the first is fundamental.[11]
5. Everything which undergoes change is a body, i. e., extended, so that local motion, time and extension can be measured by each other, but not perfectly reduced to a discrete measure.[12]
6. In every system of changing bodies there must be a first agent which is not a patient with regard to that change; for the whole universe this agent cannot be a body.[13]

These conclusions flow from the principle that physical things are both actual and potential but under different aspects. By establishing such theorems Aristotle hoped to render unnecessary the mechanical notion of nature which can explain natural change only by recourse to "the void." The void (which of course is not to be identified with the modern "vacuum")[14] is

[8] *Ibid.*, III, 1-2, 200b 1 ff.

[9] *Ibid.*, III, 2, 202a 2 ff.

[10] *Ibid.*, IV, 1-5, 208a 1 ff.; 10-11, 217b 29 ff.

[11] *Ibid.*, V, 1-2, 224a 21 ff.

[12] *Ibid.*, VI, 10, 240b 7 ff., for proof that every changeable thing is a body; for the remainder, see ch. 1-2.

[13] *Ibid.*, VIII.

[14] The modern "vacuum" designates the ideal limit of some operation by which the mass of a contained body is successively reduced. It remains a

something which is neither directly nor indirectly observable. To introduce it as a basic principle into natural science is to deprive that science of its foundations in ordinary experience. Again we see that Aristotle's conception of science is dominated by his concern for its empirical character. Democritus had introduced the concept of the void not for empirical reasons, but in order to escape the Eleatic paradoxes. Aristotle showed that such a purely logical procedure was unnecessary. Our experience shows us that things are not wholly actual like the ideal forms of the mathematician; they are under one aspect potential. Granted this potentiality of physical objects, the fact of change becomes intelligible without recourse to the void.

Did Aristotle suppose that having established these general principles he could then *deduce* from them the detailed phenomena of nature? This is the suspicion which modern scientists have always held with regard to the peripatetics. Today it is reinforced by the positivist idea that from a logical point of view every scientific theory is a series of rigid deductions from a set of axioms.

These suspicions arise from a failure to understand the peripatetic conception of the logical structure of a science. According to Aristotle each science has its unity from its study of a single genus of things known to us under a particular generic aspect.[15] In the case of the physical world we have before us an assemblage of objects all known by the fact that they are capable of undergoing processes of change. It is immediately

"field" having numerous properties and transversed by "waves" and "forces." The ancient void was absolute nothing, yet somehow dimensional, and was conceived not as ideal limit but as real entity. See H. R. King, "Aristotle's Theory of *Topos*," *Classical Quarterly* XLIV (1950) 76-96.

[15] "A single science is one whose domain is a single genus, viz., all the subjects constituted out of the primary entities of the genus—i. e., the parts of this total subject—and their essential properties. [Μία δ' ἐπιστήμη ἐστὶν ἡ ἑνὸς γένους, ὅσα ἐκ τῶν πρώτων σύγκειται καὶ μέρη ἐστὶν ἢ πάθη τουτων καθ' αὐτά.]" (*Post. Anal.*, I, 28, 87 a 37.)

evident that things known in this way are *many,* that they are both *actual* and *potential,* and that they have certain *regular* (i. e., natural) changes. Next we observe that other characteristics occur regularly in these same changeable things. This second group of observed characteristics is seen to have an *intelligible connection* with the former, but to be less fundamental since they are understood by us as *dependent* on the former. Hence they are said to be *properties* dependent on the *essence* of the thing in which they are found, an essence which is defined for us by the more basic characteristics. Thus both essence and properties are known to us through *observation,* the deductive process being used only to manifest the intelligible connection between them, and the dependence of the less basic on the more basic. For example we see that physical things must have parts because otherwise local change would be impossible. But even in this sense the number of properties which can be deduced is quite limited, the six listed above being the chief.

If natural science is to advance beyond these generic considerations of the *Physics,* it is necessary to divide the subject genus of the science into its species. These species cannot be deduced from the genus, since the *differentiae* by which they are constituted is contained in the genus only *potentially.*[16] To be sure, a knowledge of the genus assists in discovering these differentiae since it limits the field of research, but it does not automatically provide the answer to our search. To discover a differentia it is necessary to return again to observation and experience. Once the definition of a species has been discovered then the task of demonstrating its properties can proceed. This process must be repeated for each species, or if it be a sub-genus, until at last the ultimate species and its properties have been reached.

Thus natural science is not a series of deductions arrived at

[16] *Ibid.*, II, 5, 91b 12 ff.; and *Prior Anal.* I, 31, 46a 30 ff.

by sheer reflection on a few principles established by a "summary inspection of perceptible phenomena." It is a whole series of separate researches each developed by renewed observation of phenomena, yet united into a single system by the ordering of special problems under more general problems until at last the total genus is reached. Nor is it true, as some have thought, that in the peripatetic view special problems cannot be attacked until all the more general problems are solved. The perfect knowledge of a genus assists in knowing the species, but nevertheless we do not have to possess this perfect knowledge in order to study and learn a great deal about the species. To define man as a "rational animal" it is not required that I have a perfect knowledge of "animal" with all its properties, but only that I have *some* essential knowledge of the genus. Deduction, therefore, plays only a limited role in natural science, namely in the demonstration of the properties within each genus or species of things, and even there its function is to show the intelligible connection between a nature and properties whose factual inherence is already known, not to discover these properties.

If, then, we are to understand a treatise such as the *De Caelo*, we must judge it in terms of what Aristotle was attempting to do. He hoped to construct a natural science which would rest on observation at every point, which would seek to explain these observations in terms of their own intelligibility, not in some *a priori* or conventional fashion, and which would proceed from general to particular problems in an orderly but not deductive fashion.

2. The Problematics of the *De Caelo*: Major Problems

Those who have studied the Aristotelian corpus from a philological point of view have generally held that the *De Caelo* is an early work of the Stagirite, or at least shows many traces

of an early period of his development.[17] Whether this be granted or not, it is clear that it is logically an indispensable link between the general theories propounded in the *Physics* and their application to detailed problems in the *Metereologia* and the biological works. The biological works are considered by these same authors to belong to a later, perhaps to the last phase of Aristotle's thought.[18] Significantly they are the works which modern scientists have most admired and found to resemble their own point of view.

Aristotle's biology involves a definite theory of physiology, and this in turn (like that of the modern biologist) cannot be divorced from a theory of chemistry. Yet Aristotle's chemistry depends for its fundamental arguments on the system propounded in the *De Caelo*. On the other hand the *De Caelo* raises and examines a series of problems whose relevance and importance can be understood only if Aristotle already had in mind the general theorems about the natural world which he propounded in the *Physics*.[19]

[17] On the authenticity and date of the *De Caelo*, see A Mansion, *Introduction à Physique Aristotélicienne* (Louvain, 1945) pp. 1-22; W. D. Ross, *Aristotle* (London, 1949) p. 11; and W. K. C. Guthrie in the introduction to his edition of the work for the Loeb Library (Harvard, 1945). Guthrie (*loc. cit.*), Ross (*Aristotle's Physics* [Oxford, 1936]; after von Arnim, *Die entstehung der Gotteslehre des Aristoteles* [Vienna, 1931]), and recently P. Moraux ("Recherches sur le *De Caelo* d'Aristote, objet et structure de l'ouvrage," *Revue Thomiste* LI [1951] 170-196) have raised a variety of difficulties about its unity, order, etc. Finally J. Zürcher (*Aristoteles Werk und Geist* [Paderborn, 1952] pp. 131-177) has assigned all but Book I, ch. 13-14 of Book II, and traces in Book III to Theophrastus. These problems are irrelevant to the question at hand, since in any case the historical influence of the work for the history of science remains unchanged. Insofar as they touch on problems of interpretation, they will be dealt with in the course of this article.

[18] See Mansion, *op. cit.*, pp. 22-33; Jaeger, *op. cit.*, pp. 329-341; and F. Nuyens, *L'évolution de la psychologie d'Aristote* (Louvain, 1948). The latter argues that part of the *Parva Naturalia* belong to a transition period (pp. 142-171), but that the rest and *De Anima* belong to the final period (pp. 215-249; 250-254).

[19] Moraux, *op. cit.*, pp. 176-179, ingeniously relates the problematic of

In the *Physics,* as we have seen, Aristotle sought to establish that the proper viewpoint of natural science is to consider physical objects precisely as they are changeable through natural processes. Furthermore he showed that of all changes the basic one is change of *place.* "Place" is conceived by him not as mere position in a supposed "empty space," but as relative position with respect to other physical bodies that surround and act upon the body which is in place or are acted upon by it. Each body has a *natural* place, that is one to which it is observed to move regularly and where it achieves a stable condition.

Consequently the first *special* problem, after the general problems of the *Physics* which concern all changes of every type, is the natural assemblage of bodies as they undergo changes with respect to their natural places. This will be at once the most fundamental and the most common consideration possible, since every body has at least change of place, and this change is presupposed to any other change it may undergo. Thus there was an element of truth in the theories of the Atomists who attempted to reduce all change to one of position in empty space, as Aristotle is quite ready to admit. His view, however, differs radically from theirs, since he conceives of place as something natural and not merely accidental or extrinsic, and as a relative rather than an absolute reality other than that of the bodies themselves.

Even the earliest commentators debated as to exactly what the central problem of the *De Caelo* is, since this work unites problems of astronomy with problems about the elements.[20] When we consider, however, that all these entities are studied as moving in or to their natural places, the difficulty disappears.

the work to the *Topics* and to the tradition of the Eleatics. The connection with the *Physics* is more obvious. For a list of explicit references from the *De Caelo* to the *Physics,* see Guthrie's edition, pp. xxviii ff.

[20] See Moraux, *op. cit.,* for a discussion of the history of this question. See also the solution proposed by St. Thomas Aquinas in his commentary on the work (I, *Proemium*).

The author begins with the problem: *What is the perfection of the universe as it is the total subject of local motion?* [21] This term "perfection" has disturbed many historians of science who have the impression that Aristotle in this way takes his departure from the "metaphysical" assumption that the universe must be perfect and then proceeds to assert boldly, even in the face of contrary facts, that it must be such and such or it will not be perfect.[22]

These historians are correct in thinking that Aristotle has a deep religious reverence for the splendor and perfection of the cosmos,[23] but they have no warrant for the assertion that he takes as a postulate the Leibnizian doctrine that this is the best of all possible worlds. His conviction is that the universe must have a certain completeness and unity, else it could not continue to exist. Although he granted the existence of genuine chance and indeterminism in the world,[24] he rejected the pre-Socratic idea that the world has come about by chance and will eventually return to chaos.[25] Nature is the principle and cause of that which "happens for the most part," [26] hence the world is something fundamentally stable, and this stability is impossible without a relative perfection of structure. His "assumption" is similar to that of contemporary physicists who proceed with the reasonable conviction that atoms have a certain unity and completeness of structure, otherwise they could not

[21] *De Caelo*, I, 1, 268b 9. "Perfect" is perhaps better translated as "complete" [τέλειος].

[22] E. g., J. L. E. Dreyer, in his excellent work *A History of the Planetary Systems from Thales to Kepler* (Cambridge, 1906) p. 109, remarks: "In his general conception of the Kosmos, Aristotle is guided by purely metaphysical arguments [*De Caelo* II, 4 ff.]. The universe is spherical because the sphere is among bodies, as the circle among plane figures, the most perfect, owing to its unique form limited by a single surface, etc."

[23] See *Fragments* (ed. Rose), Nos. 12, 18, 19, 20, 21.

[24] *Phys.*, II, 4, 195b 31.

[25] See *Fragments* cited above, and *Phys.*, VIII, 1.

[26] *Phys.*, II, 4-6, 195b 30 ff.; especially 5, 196b 10 ff.

maintain their identity.[27] Nevertheless the exact nature of this unity, the parts which make it up, the character and necessity of their interrelations, cannot be assumed, but must be treated as *problems* which the physicist can answer only by inferences based on observed data. In the same way, although Aristotle begins with the conviction that the universe has some kind of completeness (for this is what he means by "perfection"), the nature and degree of this completeness is for him not a postulate but a problem; and this problem cannot be answered by a deduction from some postulate of perfection, but only on the basis of sense observation.

The answer to this principal problem about the completeness of the universe occupies the whole of *De Caelo* I, which is thus a *general* treatise on bodies as they change place, while Books II to IV constitute a *special* treatise on the different types of bodies which undergo change of place.[28]

[27] "Throughout all our efforts, in every dramatic struggle between old and new views, we recognize the eternal longing for understanding, the ever-firm belief in the harmony of our world, continually strengthened by the increasing obstacles to comprehension." A. Einstein and L. Infeld, *The Evolution of Physics* (New York, 1938) pp. 312 ff.

[28] Moraux, *op. cit.*, pp. 172-176, believes that Books I and II form a continuous literary whole, divided into two books only for some editorial reason. The logical break, he holds, comes between ch. 6 and 7 of Book II. Up to this point Aristotle has spoken of the heavens as a whole, first in its *being* (I, ch. 1-4), then as regards *quantity*, *quality*, and *motion*. The discussion of motion continues through to the end of Book II, ch. 6, whose last line reads: "Here we may end our account of the uniqueness of the world, its ungenerated and eternal nature and the regularity of its motion. [*Ὅτι μὲν οὖν εἷς τε μόνος ἐστὶν οὐρανός, καὶ οὗτος ἀγένητος καὶ ἀΐδιος. ἔτι δὲ κινούμενος ὁμαλῶς. ἐπὶ τοσοῦτον ἡμῖν εἰρήσθω.*"] (289a 10) (Aristotle does not mention the problem of the infinity of the world, but no doubt includes this with the problem of its unicity.) In the rest of Book II, the problems no longer concern the heavens as a whole, but the stars and the earth. This explanation, however, makes II, ch. 3, seem out of place, and therefore Moraux considers it a later addition. It seems preferable to accept the received arrangement of the text. The problems about the left and right hand of the heavens, the plurality of motions, the sphericity of the heavens, and the direction of motion are *special* problems in comparison with the problems of the infinity and unicity of the universe. Hence Aristotle, or

This question of the perfection of the universe as a whole has precedence over all the other problems of special natural science in the *order of intention.*[29] The architect first lays down a general plan for a building and this plan should show all the essential parts which make it a particular kind of building, a residence or factory. It is this general plan which the builder primarily *intends* to execute and its parts are the essential parts [30] without which the house or factory would not be such. Indeed in the conceiving of the plan these parts come before the whole, for the very meaning of a house for the builder who plans it is a structure with foundations, walls, roof. But when he comes to build the house and to realize this basic plan he must add many other detailed parts. These contribute something to the completeness of the building, but they are only secondarily intended and did not enter into the basic plan. Such parts come *after* the whole in the architect's intention, as additions and adornments only. Thus to inquire about the perfection of the universe is first of all to look for its essential parts, its basic plan. If this plan can be discovered, then all the subsequent questions of physics fall into place since they will be questions of detail, they will concern the additions and adornments of the physical world.[31]

This principle question of *De Caelo* I is divided by Aristotle, following the general plan of all scientific demonstrations, into a question about the plan itself, and one about its properties. Each of these has several subdivisions:

---

the editor of the work, properly separated these questions from Book I. Book II, ch. 1, serves as a summary of Book I and a transition to the special problems. The medieval commentators, St. Albert, and St. Thomas Aquinas seem to have read the work in this manner.

[29] See the *Prooemium* of the commentary of St. Thomas Aquinas for the distinction of these orders in the methodology of Aristotle.

[30] *Meta.*, Δ, 25, 1023b 11 ff.

[31] Cf. St. Thomas Aquinas, *Summa Theol.*, I, 70, 1.

1. Is the universe *complete*?
   (a) Quantitatively (i. e., on the part of its matter)
      (1) as a body?
      (2) as a body which is unique because it is the whole?
   (b) Qualitatively (i. e., on the part of its form), i. e., what are its essential parts as defined by local motion, i. e., does it contain a perfect system of natural places?
2. What are its *properties* as it is complete?
   (a) Is it infinite in magnitude?
   (b) In multitude?
   (c) In duration?

The problem about the properties of the universe is stated as a question about its infinity because most errors concerning cosmic perfection arise from the notion that unless the universe be infinite it cannot embrace the whole of physical reality.[32] These properties of magnitude, number, and duration pertain to the universe because it is a body, and concerning every body we must query as to its quantity, and its position in place and time.[33]

Problem 1 is answered by showing that the universe is quantitatively complete not because it is divisible into the three dimensions (as is every body), but uniquely in that it is the totality of body outside which there is no other body, nor quantity, nor place, nor time.[34]

Furthermore it is quantitatively or structurally complete because, composed as it is from simple bodies having the two possible types of simple motion, it is so constructed as to provide natural places in which these bodies may move and rest.[35]

Problem 2 is answered by showing that it is a property of such a universe to be infinite in duration, finite in magnitude, and unique in number.[36]

[32] *De Caelo*, I, 5, 271b 3-18.
[33] Cf. *Phys.*, IV and VI.
[34] *De Caelo*, I, 1, 268b 8; 9, 278b 1 ff. and 279b 13.
[35] *Ibid.*, I, 2, 268b 11 ff.
[36] *Ibid.*, I, 5 to the end.

This order of problems, which certainly appears very clear, is altogether different from the order found in modern physical treatises on motion in place. The modern or Galilean physicist begins such a treatise with a discussion of the forces which produce local motion, gravity playing the fundamental role, and other forms of "attraction" and "repulsion" following. These forces are defined in terms of the changes of position of particles which they are supposed to produce, and such positions, whether of place or time, are in turn defined in a strictly relative manner with respect to arbitrary coordinates.

The Galilean physicist can hardly do otherwise, for he intends to produce a mathematical argumentation, and this will be possible only if he reduces the data of observation to terms of measurement. Since this measurement is according to a purely external and relative standard, the forces so defined must be conceived as purely external forces.[37]

Aristotelian physics, on the other hand, is not seeking a mathematical argument as its chief work, but is trying to obtain an understanding of nature as it is natural. It cannot, therefore, afford to obliterate the fundamental distinction between natural motion and violent or extrinsic motion. In the *Physics* Aristotle established that violent motion always presupposes natural motion and hence a special study of motion must begin with the latter type.[38]

Yet to be a physicist at all, the Aristotelian as well as the Galilean, must define all these terms in reference to *observation*. Nature, by the very fact that it is an internal principle, is not observable, but the motion which proceeds from nature as from its principle is observable. We must, therefore, observe natural motions if we wish to know the nature of the things that move.

How then are we to know if a motion is natural? Motions are

[37] See H. Margenau, *The Nature of Physical Reality* (New York, 1950) ch. 12: "The Role of Definitions in Science," pp. 220 ff.

[38] *Phys.*, IV, 8, 215a 1; also *De Caelo* II, 294b 31 ff.

defined by their goals,[39] hence a natural motion is one which regularly proceeds to a naturally determined place. Thus the problem of knowing nature by motion is the problem of knowing natural motion, and the problem of knowing natural motion is the problem of discovering and observing natural places, and the natural places will be those naturally determined places in which *in pluribus* motions come to rest.[40]

An extremely serious objection can be brought against Aristotle's procedure, an objection based on his own fundamental principle that inquiry must begin with what is better known. What is less known to us about the cosmos than the cosmos as a *whole*! We are confined to a narrow corner of its vastness. Our experience reveals that corner to us, but can only hint mysteriously at what lies beyond. Yet Aristotle dares to begin with the cosmos in all its totality, and in terms of its impenetrable mystery to explain the well known and evident facts against which we daily stub our toes. The modern physicist seems in this regard rather more Aristotelian than Aristotle, for the modern leaves the cosmological problem to the end of his science, first attempting to gather every bit of more accessible and testable information before daring to make a synthesis which may give some clue to the mystery of the whole.

In accusing Aristotle we must, however, admit that he was sufficiently aware of the paradox himself. Although less cognizant of the spatial vastness of the universe than we are,[41] he

[39] *Phys.*, V, 1, 224b 7. [40] *Ibid.*, II, 5, 196b 10.

[41] We do not know the dimensions which Aristotle ascribed to the universe as a whole. He knew the approximate size of the earth and considered the universe to be incomparably more vast. The medieval Arabian peripatetic Al-Fergani, relying on the estimates of the distance of the sun and moon achieved by the measurement of their parallax by the Hellenistic astronomers, and the supposed number and arrangement of the spheres, calculated the radius of the universe at 20,110 earth radii, i.e., some 80,000,000 miles (see Pierre Duhem, *Système du Monde* [Paris, 1913-17] II, 9). The peripatetic estimate was thus of a quite different order from our own, but it was not a naïve, "common-sense" view.

put even a deeper qualitative gap between the cosmos as a whole and the terrestrial region than facts known today compel us to do. Never does he cease to emphasize that we can say little of the heavens, for they hardly are attainable by our senses and they are utterly unlike the things which our senses do securely attain.[42]

Nevertheless Aristotle was also firm in his insight that some parts of the universe are essential parts, others pertain to it secondarily. If we know the essential parts we have grasped the basic plan of the universe at least in some general manner. But if we do not know these essential parts, neither can we know the secondary parts, for these are posterior to the whole and intelligible only in relation to it. Hence if we do not know the whole neither do we know the parts whether essential or additional. If we know neither whole nor any kind of part, then physical science is an impossibility.

We must indeed always pass from the better known to the less known, but in the progress of human knowledge, there are certain crises where it seems as if this principle closes the way. We glimpse beyond a vista of questions which no doubt could be solved easily if only we could resolve a certain crucial problem, on whose answer the answers to all the others depend as upon something which *if it were known,* would be the *better* known. And yet this crucial problem seems to demand a fatal leap into the dark.

Such a crisis occurs precisely at the point where we must pass from general physical science to special physical science. The principles of the former can be certain because they are so

[42] "The question must be asked why there are several different revolutions, although we are far removed from the objects of our attempted inquiry, not in the obvious sense of distance in space, but rather because very few of their attributes are perceptible to our senses." [. . . *σκεπέον διὰ τί πλείουι, εἰσὶ φοραί, καίπερ πόρρωθεν πειρωμένοις ποιεῖσθαι τὴν ζήτησιν, πόρρω δ' οὐχ οὕτω τῷ τόπῳ, πολὺ δὲ μᾶλλον τῷ τῶν συμβεβηκότων αὐτοῖς περὶ πάμπαν ὀλίγων ἔχειν αἴσθησιν.*]" (*De Caelo,* II, 3, 286a 5.)

universal and hence are exemplified in almost every item of our experience. But the application of these principles to the concrete structure of our universe (which application constitutes the proper work of special physical science) at once confronts us with the problem of the whole and the part, with the fact that we are inextricably a part of the whole and thus unable to step off and get a look at the whole.

The objectivity of science is thus imperiled by the necessary subjectivity of a part which sees the whole not as whole, but only as related to itself. The contemporary problem of the "privileged position" of an observer is a modern instance of this same difficulty.[43] To identify this privileged observer it would be necessary to know the whole and thus to see which parts of it possess privileged positions and which do not. The mathematical physicist may have excuse for constructing hypotheses in which the scientist is imagined as outside looking down upon the universe with complete objectivity; but the moment he tackles the problem of giving such a hypothesis a physical meaning in terms of possible operations of observation, it is all too apparent that the observer is in fact *inside* the universe, limited by his function as a part of the whole.

The problem, therefore, which Aristotle tackles in *De Caelo* I is inevitable; it is none other than the relativistic dilemma which has again come to dominate science today.[44] Aristotle had no choice but to tackle it, if he was to save the possibility of truly physical science. The fact that he undertook it as the first prob-

[43] Cf. A. Eddington, *The Philosophy of Physical Science* (Cambridge, 1949) pp. 12 ff.

[44] Margenau, *op. cit.*, p. 411: "Relativity is no longer a subject hidden in a remote niche of physics; it pervades and dominates the entire field." He interestingly remarks (p. 143) that perhaps the remarkable development of post-Newtonian physics was due to the circumstance that this relativity was *ignored*. "One may see in this fortunate contingency the reason why physics, sheltered by a favorable providence, was able to enjoy the simple and well-regulated youth that led to a vigorous manhood. Other sciences have run up against relativities in their infancy."

lem of special physical science does not mean that he abandoned his determination to proceed always from what is better known. It means that he was valiantly attempting to apply that principle to a problem of extreme difficulty, but which could not be shirked if natural science was to proceed beyond the general problems of the *Physics.*

In a following article the value of Aristotle's attempted solution will be discussed. For the present it must be concluded that the central problem of *De Caelo* I is logically chosen and strategically placed as the necessary theme of a general treatise on bodies as changing place.

3. Special Problems

This general treatise defines the main types of bodies which move locally. Next there is needed a *special* treatise to consider each of these types of bodies in detail, and this is provided by *De Caelo* II-IV. The following list of questions indicates Aristotle's procedure:

1. Problems about the circumferential region: (Book II)
   (a) Problems about the spheres:
      (1) Is there a *differentiation of the parts* of the spheres so that we can speak of an above and below, or a right and a left in them?
      (2) What is their *figure*?
      (3) What are their *motions*?
      Why do they have the *direction* of motion which they do?
      Are these motions equal in *regularity* and *velocity*?
   (b) Problems about the stars (including planets, sun and moon) which are the most active parts of the spheres:
      (1) Are they of the same *matter* as the spheres?
      (2) Are their *translational* motions *independent* of those of the spheres?
      Do they have an independent *rotatory motion*?

(3) What is their *arrangement*?
What is the *coordination* of their motions?

(4) What figure do they have?

(5) Certain special difficulties about them:
Why are all the fixed stars in the primary moving body?
Why do the *intermediate* planets have the most complex motions?

2. Problems about the center:

(a) What is the *position* of the earth?
Does it have *motion* or is it stable?

(b) What is its *figure*?

3. Problems about the intermediate region: (Books III-IV)

(a) Refutation of other theories of the *elements* (the heavy and the light) and the conditions of a good theory:

(1) It must *identify* the elements by simple natural motions.

(2) It must *relate* these elements to the *heavy and the light,* since it has been shown that the only natural motions in this region must be defined as to or from the center.

(3) It must account for a true *generation* of these elements which cannot be one in number, nor infinite in number, and which must be generated from each other.

(b) Answer to this problem as given by the theory of the *four elements.* A *reconciliation* of this theory with the truths found in the erroneous theories.[45]

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[45] Moraux, *op. cit.*, believes that the opening lines of Book III are due to a later editor, since they do not seem to summarize the preceding books accurately. Furthermore, he argues that ch. 2 (on the motion of the elements) is out of place, and should follow the discussion of their quantity and quality given in chapters 4-8. Again, he believes that the *De Generatione et Corruptione* was written to replace *De Caelo* III, because *De Generatione* I, 1-5, seems to repeat the discussion of the problem of the nature and reality of generation already given in *De Caelo* III, then to add new material (ch. 6-10); and finally in Book II is settled the problem about the number and mutual generability of the elements, which is raised but not answered definitively in the *De Caelo*. *De Caelo* IV, a work notoriously difficult to interpret because of its laconic style, he believes to be conceived as a separate treatise inserted editorially in the work made up of the *De Caelo* and the *De Generation*, but composed by

Again the order of these questions is very clear. St. Thomas in commenting on this order observes that in every structure two types of parts require special consideration: [46]

1. There are certain parts which are essential because they have great power, perfection, and intelligibility in themselves, as the heart and the head in an animal body. For the universe the heavenly bodies and the earth are such fundamental parts on which the whole cosmic fabric depends.

2. There are also certain parts which are essential not by their nobility, for they are simplest and least noble, but because they are the *elements* from which other things are composed. In an animal body these are tissues. For the universe (or rather for the sublunar region since it alone contains composed bodies) these composing parts are the heavy and the light, i. e., the four elements.

Thus Book II and its problems about the circumferential region and the center precede all the other treatises of special physical science because they deal with the most *formal* parts of the universe. The heavens include the rest of the universe and constitute its place, and place is as the form of a body.[47] The earth is not a form in this way, but it is formal in that the motions of up and down are specified with respect to the center which it occupies. Since form is as such better known than the matter related to it, it is in accordance with the principle of going from the better known, that we treat these *formal parts* first. Although we have but little knowledge of them, what we

Aristotle himself. This careful study of Moraux helps to explain the literary roughness of the work, but does not disprove its logical unity. The position of III, ch. 2, seems to me to be required by the fact that in each case it is necessary to prove the existence of a body from its type of natural motion. The repetition at the beginning of the *De Generatione* is explicable by the fact that this is the first of a very distinct set of treatises, those dealing with alterative rather than local motion.

[46] Cf. St. Thomas Aquinas, *In De Caelo*, I, *Prooemium*.

[47] *De Caelo*, IV, 3, 310a 34.

do have is explanatory of the greater mass of details which we can obtain concerning the other more accessible but less intelligible parts. For example we know little of the sun, yet we do know that it is the source of energy for terrestrial changes, and this single fact provides us with a principle by which we explain many things much easier to observe in detail.

Books III and IV precede all the other books of special physical science because they introduce the problem of the four elements. Not only are these four elements the *material cause* of all that is to follow, but from a consideration of them arises the great problem of *generation* and *corruption*. The motions of the heavy and the light are *contrary* motions (unlike the circular motion of the spheres which is without a contrary) and contrariety of forms implies alteration, generation and corruption, and the possibility of growth and decrease. It is these new problems, not met with at all in Books I and II which, for their solution, demand the formation of other treatises than that on local motion.

Within each of these three books in relation to the particular problems concerning the cosmic regions he proves a series of *properties* of a subject, which subject is a simple natural body defined in terms of its natural motion.

Thus it is proved that the spheres, which are defined as simple bodies circularly moved, have parts differentiated according to quality (the stars). Furthermore it is proved of the whole set of the spheres that they are spherical in figure, because this is adapted to their circular motion, and it is proved that this motion has great uniformity and velocity both because it is circular and because the bodies are adapted to such perfect motion. Of the stars as parts of the spheres it is proved that they have no independent motion, that they are arranged in such a manner that their apparent motions are explicable by the motions of the spheres, and that they have the same figure as the spheres.

Concerning the earth it is proved that it is at the center defined by the circular motion, and is thus itself defined as the body that rests at the center, and that this rest requires that its figure be spherical. Concerning the intermediate region it is proved that since the bodies it contains are defined by straight motion, they must have the property of being generable and corruptible. Hence as simple bodies they are elements of the generable and corruptible and are mutually generable from each other. But since generation is a different type of change than local motion, we are led to the necessity of new treatises in special physical science.

4. Aristotelian Mechanics

The enumeration of the problems treated in *De Caelo* makes it very clear that they do not include those questions which modern physics regards as initial in physical theory. The modern physicist might grant that theoretical physics begins with certain broad (and rather vague) questions of a "philosophical" sort, which have some correspondence with the type of problems about the nature of matter, motion, time, and space, and the methodological assumptions on which we study them contained in Aristotle's *Physics*. But he would certainly consider that the initial questions in a formal development of theoretical physics would be those of *mechanics*.

Lord Kelvin states this point of view neatly in the first paragraphs of his *Treatise on Natural Philosophy*:[48]

> There are many properties of motion, displacement, and deformation, which may be considered altogether independently of such physical ideas as force, mass, elasticity, temperature, magnetism, electricity. The preliminary consideration of such properties in the abstract is of very great use for Natural Philosophy, and we devote to it, accordingly, the

[48] (Cambridge, 1923) p. 1. I quote Lord Kelvin because he so perfectly manifests the Newtonian tradition. See also the first pages of M. Planck, *Introduction to Theoretical Physics*, tr. H. Brose (New York, 1949).

whole of this our first chapter; which will form, as it were, the Geometry of our subject, embracing what can be observed or concluded with regard to actual motions, as long as the *cause* is not sought.

In this category we shall take up first the free motion of a point, then the motion of a point attached to an inextensible cord, then the motions and displacements of rigid systems—and finally, the deformations of surfaces and of solid or fluid bodies. Incidentally, we shall be led to introduce a good deal of elementary geometrical matter connected with the curvature of lines and surfaces.

Unhesitatingly the tradition which runs from Copernicus and Galileo through Newton to Kelvin and Planck begins its study of nature abstracting from questions of cause [49] and considering the mechanics of a massive body whose motion or stable position can be predicted mathematically given a measurement of the pushes or pulls acting upon it. The problems raised are all about the mathematical relations between these pushes and pulls and the resultant motion or rest.

Attempts have been made to discover similar questions in the *Physics* and *De Caelo* of Aristotle. In the *Physics* in the course of his refutation of the void Aristotle made certain notorious statements about the proportion between the weight of a falling body and its velocity, as well as the modification of this velocity

[49] "Hitherto we have explained the phenomena of the heavens and of our sea by the power of gravity, but have not yet assigned the cause of this power. This is certain, that it must proceed from a cause that penetrates to the very centre of the sun and planets, without suffering the least diminution of its force; that operates not according to the quantity of the surfaces of the particles upon which it acts (as mechanical causes used to do), but according to the quantity of the solid matter which they contain, and propagates its virtue on all sides to immense distances, decreasing always as the inverse square of the distances. . . . But hitherto I have not been able to discover the cause of those properties of gravity from phenomena, and I frame no hypotheses; for whatever is not deduced from the phenomena is to be called an hypothesis; and hypotheses, whether metaphysical or physical, whether of occult qualities or mechanical, have no place in experimental philosophy. In this philosophy particular propositions are inferred from phenomena, and afterwards rendered general by induction." (*Principia Mathematica*, III, General Scholium, Cajori ed., pp. 546 ff.).

by the shape of the body and the density of the medium.[50] In another passage of the same work [51] he spoke of the acceleration of falling and rising bodies. Again he discussed the proportion between force, weight, and velocity in order to show in what sense motions are comparable.[52] In the *De Caelo,* discussing the relative positions and motions of the elements, he treats (in what appears to be a rather muddled manner) of the problem of relative density. Finally in the same work [53] he speaks of the proportion between velocity and weight while attempting to prove that all bodies (except the ether) must have weight or lightness, and to answer difficulties about projectile motion.[54]

Some of these passages are very obscure and gave rise to no little controversy among the Arabian and medieval commentators. In the later Middle Ages when questions of mechanics began to be very seriously discussed, attempts were made to clarify the passages by a mathematical formulation of the laws of motion. The results were highly unsatisfactory and the confusion was not removed until Galileo, not without several false starts, discovered the correct formulae.[55] Modern commentators have generally followed the same path and spoken of Aristotle's groping attempts to formulate dynamic laws. Ross even suggests that the Stagirite would probably have anticipated Galileo's discoveries if he had only been a better mathematician![56]

These authors, both modern and ancient, have wasted their

[50] *Phys.*, IV, 8, 214b 12 ff.
[51] *Ibid.*, V, 6, 230b 24.
[52] *Ibid.*, VII, 4-5, 248a 10 ff.
[53] *De Caelo*, IV, 4, 311a 15 ff.
[54] *Ibid.*, III, 3, 300a 20 ff.
[55] Cf. A. Maier, *Die Vorläufer Galileis im 14 Jahrhunderts* (Rome, 1949).
[56] W. D. Ross, *Aristotle's Physics* (Oxford, 1936) p. 29. See his whole discussion, "Aristotle's Dynamics," pp. 26-32; Duhem, *op. cit.*, vol. I; and, recently, Ernest Moody, "Galileo and Avempace," *Journal of the History of Ideas* XI (1951) 163-193, 375-422, for examples of efforts to find a dynamic theory in Aristotle.

efforts. A simple reading of Aristotle's context will show that he had no intention of formulating dynamic laws. In most of the cases he is arguing from *suppositions* with the purpose of showing dialectically that certain alternatives to his own principles must be rejected.[57] In other cases his argument requires only that there be *some* proportion between physical quantities. What the proportion may be is irrelevant.[58]

The fact is that for Aristotle questions dealing with definite mathematical relations among physical quantities and their explanation in mathematical terms, do not pertain to natural science, but to the "mixed sciences" of mathematical-physics. Hence he carefully excludes them from his considerations in the strictly physical treatises.

Does this mean that for the peripatetics mathematical-physics is valueless? We have Aristotle's own statements to show that he recognizes its validity in astronomy.[59] There are also refer-

[57] Ross, *op. cit.*, finds the following main errors in Aristotle's theory: (1) He does not see that all weight is relative, and is supported in his mistake by his erroneous belief that a skin filled with air is heavier than one which is empty (*De Caelo*, IV, 3-4, 310a 16 ff.). (2) He has a wrong theory of velocity (*Phys.*, IV, 8, 215a 1 ff.; VII, 5, 249b 26 ff.; VIII, 10, 266a 10 ff.). (3) He has the mistaken notion that the medium is a cause rather than a hindrance of motion (*Phys.*, IV, 8, 215a 14-17; VII, 10, 266b 27-267a 20; *De Caelo*, III, 2, 301b 22-29). (4) He fails to realize that circular motion might be a resultant of two rectilinear motions (*De Caelo*, I, *passim*). As to these it should be noted: (1) The first difficulty is indeed based on an erroneous experiment, but the point of the argument is only to show that air is not absolutely light, but that it is heavy in some locations. Only the least dense body could be absolutely light. (2) The second arises from the attempt to find a theory of mathematical proportion, where Aristotle is concerned only with showing the supposition that the void is a *cause* of motion leads to inconsistencies. (3-4) The third and fourth are not "disproved" by the Newtonian laws of motion; these are mathematical laws, not explanations of the physical causality of motion. See note 49 above. (5) The last will be discussed in the following article. Ross himself shows that in *Phys.*, VII, 2, 243a 17, Aristotle manifestly realizes that some circular motions can result from two rectilinear forces.

[58] See the references under the first and second difficulties in the preceding note.

[59] Cf. *Post. Anal.*, I, 13, 78b 35 ff.; *Meta.*, A, 8, 1073b 1-8. For a collection

ences to the science of optics or perspective, acoustics, and to mechanics.

The *Mechanica* contained in the Aristotelian corpus is usually considered not to be authentic, but it is of peripatetic origin.[60] The author of this work explicitly defines mechanics as a *practical* science, but says that it has something both of physical science and mathematics.[61] In other words it is *applied* mathematical physics. Beginning with a treatment of certain properties of a mathematical circle, it shows that we can apply the circle to explain a number of physical phenomena, especially those of levers, and that these can be used to construct various useful machines and instruments. This does not mean, however,

of references with commentary, see B. I. Mullahy, C. S. C., *Thomism and Mathematical Physics*, Dissertation, 2 vols. (Quebec: University of Laval, 1946).

[60] Mansion, *op. cit.*, pp. 44 ff., note, shows it to be improbable that any large part of Aristotle's physical works is lost to us. There were numerous ancient works on mechanics following the peripatetic tradition. For selections, see M. Cohen and I. E. Drabkin, *A Source Book of Greek Science* (New York, 1948) pp. 183-256.

[61] "Nature often operates contrary to human expediency; for she always follows the same course without deviation; whereas human expediency is always changing. When, therefore, we have to do something contrary to nature, the difficulty of it causes perplexity, and art has to be called to our aid. The kind of art which helps us in such perplexities we call Mechanical Skill . . . instances of this are those cases in which the less prevails over the greater, and where forces of small motive power move great weights—in fact, practically all those problems we call mechanical problems are not quite identical nor yet entirely unconnected with natural problems. They have something in common both with mathematical and with natural speculations; for while mathematics demonstrates *how* phenomena come to pass, natural science demonstrates *in what medium* they occur. [*ἐν πολλοῖς γὰρ ἡ φύσις ὑπεναντίον πρὸς τὸ χρήσιμον ἡμῖν ποιεῖ. ἡ μὲν γὰρ φύσις ἀεὶ τὸν αὐτὸν ἔχει τρόπον καὶ ἁπλῶς, τὸ δὲ χρήσιμον μεταβάλλει πολλαχῶς. ὅταν οὖν δέῃ τι παρὰ φύσιν πρᾶξαι, διὰ τὸ χαλεπὸν ἀπορίαν παρέχει καὶ δεῖται τέχνης. διὸ καὶ καλοῦμεν τῆς τέχνης τὸ πρὸς τὰς τοιαύτας ἀπορίας βοηθοῦν μέρος μηχανήν . . . τοιαῦτα δέ ἐστιν ἐν οἷς τά τε ἐλάττονα κρατεῖ τῶν μειζόνων, καὶ τὰ ῥοπὴν ἔχοντα μικρὰν κινεῖ βάρη μεγάλα, καὶ πάντα σχηδὸν ὅσα τῶν προβλημάτων μηχανικὰ προσαγορεύομεν. ἔστι δὲ ταῦτα τοῖς φυσικοῖς προβλήμασιν οὔτε ταὐτὰ πάμταν οὔτε κεκωρισμένα λίαν, ἀλλὰ οἷονὰ τῶν τε μαθηματικῶν θεωρημάτων καὶ τῶν φυσικῶν. τὸ μὲν γὰρ ὡς διὰ τῶν μαθηματικῶν δῆλον, τὸ δὲ περὶ ὃ διὰ τῶν φυσικῶν.*]" (*Mechanica*, 847a 14 ff.)

that the peripatetics rejected the use of mechanical analogies in theoretical physics, nor mathematical theories based on them.[62]

We also find Aristotle himself in his *De Motu Animalium* [63] applying the theory of the lever to the motions of the limbs of animals. In the *Meteorologia* as well are some hints of the application of the mathematical theory of proportions to the explanation of chemical combination. Hence in all branches of special natural science, whether physics, chemistry, or biology Aristotle seems to admit the validity of mathematical theories.[64]

What did he conceive the relation to be between such mathematical-physical theories and purely physical ones? First of all it must be observed that he considers them to be *formally* distinct, so that they cannot be reduced to the same subject genus. Natural science and a mathematical-physical science are essentially distinct sciences since they define their subjects in

[62] Historians who seek to find in Aristotle's work periods characterized by mechanism and anti-mechanism fail to note that Aristotle in the first book of the *Physics* presents his own theory of nature as an attempt to *synthesize* the mechanical and Platonistic tendencies which preceded him. Mechanical explanations are perfectly acceptable to him as the answer to certain types of questions, but not to others. See R. Brumbaugh, "Some Recent Works on Aristotle and One on Plato," *Review of Metaphysics* VII (1954) 602-612.

[63] Cf. *De Motu Animal.*, 3-4, 699a 12 ff.; 7, 701b 2 ff.

[64] J. Maritain says that mathematical physics "was not unknown to the ancients, but they had discerned it only in restricted and particular fields such as astronomy, harmony, and geometric optics." (*Philosophy of Nature* [New York, 1951] p. 37). Hence, he argues, it is understandable that Aristotle did not realize that the philosophical method and the scientific method are quite distinct, since he had not seen the fruitfulness of the universal application of the "empiriometric" method to natural phenomena. But this is hardly accurate. To be sure it was to the type of problems mentioned that the ancients especially applied mathematical methods, but Aristotle shows that he understands the value of mathematical argumentation not only in restricted fields, but in the three great branches of physics, chemistry and biology into which he divides the whole of natural science. If he was mistaken (as Maritain believes) in confusing the proper spheres of natural "philosophy" and natural "science" it was not because he was ignorant of any of the major epistemological types now recognized by philosophers of science.

different ways and demonstrate properties of them through different types of middle terms.[65] Furthermore the physical is prior to the mathematical-physical, because it deals with the very natures of the objects, while the latter consider these objects merely under the aspect of quantities without being able to assign their physical causes. Hence for Aristotle mathematical physics presupposes the physical study of things. For him, for example, the mathematical theory of astronomy is posterior to the physical theory of astronomy.

Is mathematical physics then a true science? At first it might seem that for Aristotle it is merely dialectical in character. As Duhem showed very well, the ancients were keenly aware that the astronomical theory of the spheres was a mere "saving of the appearances." Like many modern writers, they saw that a mathematical theory needs to be applied to physical facts, and agreement is always only approximate, since we do not know whether the mathematical model perfectly fits the physical reality. Since even a slight change in data might require an entirely different theory, or the same data might be accounted for by an indefinite number of models among which we could select only on the basis of simplicity, it seems clear that such argumentation is merely dialectical, or probable.

But Aristotle repeatedly says that mathematical physics can give a true *propter quid* demonstration, not indeed of the physical causes but of the mathematical causes of the quantitative relations in a physical thing. Hence it is a true science, and not merely dialectics. How is this possible? The answer is a simple one. If we know as a matter of fact that a physical object has a certain natural quantity proper to it, then we can show mathematically the proper reason for its having certain quantitative relations. Thus if we know that it is natural for a star-fish to have a circular form, we can assign a proper reason for its

[65] *Post. Anal.*, I, 13, 78b 35 ff.; *Meta.*, A, 8, 1073b 1-8.

radial symmetry, and this reason is of the mathematical order In such cases the problem of "fit" does not enter, since we begin with the fact that circularity, although approximate, does actually belong to the star-fish. But in the astronomical case, or in typical modern physical theories, this fact is not known; all that is known are series of observations which may be accounted for by several figures.

Thus for Aristotle mathematical-physics is a true science, distinct from physical science, but ancillary to it, in the following ways:

1. It can give genuine proofs which add to our knowledge of the physical objects as regards certain properties; these can then be given causal explanation by physical science. Thus the mathematician can tell the biologist why a circular wound heals slowly, but the physicist as such must explain the process of healing.

2. It can give a proof which is physically valid in a negative sense, i. e., it can disprove the physical possibility of the existence of a certain quantity, or quantitative relation. Thus Aristotle uses mathematical proofs to show the impossibility of an infinite universe.

3. It can give dialectical proofs. These assist physical science in two ways:

a. By supplementing it where the facts cannot be well observed, as in astronomy.

b. By suggesting where to look for physical proofs; thus the mathematical proof for the circularity of the earth, suggests the search for a physical explanation.

Hence Aristotle far from rejecting mathematical-physics saw it as of considerable use to physical science, although he did not forsee the immense fruitfulness which it has actually attained with modern techniques.

Conclusion

Our survey of the problematics of Aristotle's *De Caelo* shows that it treats of problems which are strictly physical-causal in character, and that this viewpoint is consistently maintained. The Copernican theory and the mechanics of Galileo and Newton on the other hand were developed in answer to a different set of problems, the problems which Aristotle would have assigned to a distinct science, that of mathematical-physics. Nevertheless it has also appeared that this latter point of view is not excluded by Aristotle, but rather specifically provided for by him. The hesitations of Tycho Brahe and others of the 17th century thus arose from a double source (leaving the theological problem to one side):

1. Was the theory satisfactory from a mathematical-physical point of view? Hence the problems about the parallax, etc.

2. Was it satisfactory from a physical point of view, i. e., did it agree with the known physical character of the earth and the heavens?

Obviously from these two questions a third arises. Do we know enough physically about the earth and heavens to form a mathematical-physical theory which is certain? In a subsequent article on the methods of proof by which Aristotle developed his physical theory of the heavens I will consider the import of this problem.

Albertus Magnus Lyceum for Natural Science,
River Forest, Illinois.

William James and Maurice Blondel

by Frederick J. D. Scott, S.J.

THE DIRECTION philosophy was taking at the beginning of our century was manifested at the First International Congress of Philosophy held at Paris in 1900. Émile Boutroux summarized the results of the papers read and the discussions they occasioned by noting that, "Philosophy of knowledge, for which the sciences furnish the material, is not the whole of philosophy. Just as real and legitimate is the philosophy of action, life properly so-called, the social and individual destinies of humanity."[1] Maurice Blondel's philosophy of action, as expressed in his book, *L'Action*,[2] and articles, was partially responsible for the recognition of this tendency and its legitimacy. A few years later, William James re-echoed the sentiments of this congress: "Life is confused and superabundant, and what the younger generation appears to crave is more of the temperament of life in its philosophy."[3]

It might be of interest and instructive to know the personal and philosophical relationship of Blondel and James as an instance of how philosophers help each other to advance a general current of thought, even though they may disagree on the meaning of some of the terms they both employ.

In the preface to his *Pragmatism* James gave a few references to the reader, if he wished to pursue the subject farther. Among these he listed Blondel and Bernard de Sailly.[4] Of

[1] *Revue de Métaphysique et de Morale*, VIII (1900) 697-698. All translations are mine.

[2] (Paris, 1893).

[3] W. James, *Essays in Radical Empiricism* (New York, 1912) p. 39.

[4] W. James, *Pragmatism* (New York, 1907) p. XIV. These references are: M. Blondel, "Le Point de Départ de la recherche philosophique," *Annales de Philosophie Chrétienne*, 4th. series II (1906) 225-250. B. de

course, James could not know that Blondel also wrote under the pseudonym of "de Sailly," but it is to his credit that he recognized the similarity of doctrine. It is surprising, however, that James did not also refer to Volume One of this series, because it contains the first part of Blondel's two-part article and another by "de Sailly," "Les Ingrédients de la philosophie de L'Action," which stated Blondel's position with regard to the new movement in philosophy.

There is no evidence that James made any use of the content of these articles in his *Pragmatism,* although he wrote to Blondel: "You have struck a magnificent note in the *Annales.* I have copied whole pages of your words."[5] The comments which James added to the passages he copied give some indication, as we shall see, why at this stage of his philosophical development James did not make use of Blondel's ideas despite the approval of the general direction of his thought. The influence of this article on James is, however, clear in his *A Pluralistic Universe.*[6]

A detailed analysis of "Le Point de Départ" is required, if one wishes to judge the accuracy of the high praise James bestowed on it.

The problem Blondel tried to solve was: "How can philosophy constitute both a technical discipline and yet be inserted into the common life of humanity?"[7] The answer lies in establishing the proper starting point of philosophy by taking account of the two inseparable and irreducible aspects of knowledge in act, fragmentary reflection and total "prospection." This latter term was coined by Blondel to designate:

> a knowledge which, perfect in its kind, is direct, at the service of our

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Sailly, "La Tâche de la philosophie d'après la philosophie de l'action," *ibid.*, III (1906-7) 47-59. Later cited as *A. P. C.*

[5] *Infra*, note 36.

[6] (New York, 1909).

[7] "Le Point de Départ," 225.

actual and real plans, bound up with our total life, turned towards the future which it anticipates so as to rely on it already by foreseeing and evoking it, and, finally, capable of growing in clarity and precision without losing anything of its synthetical and practical character.[8]

On the other hand, "reflection is a knowledge turned towards results obtained or processes used, such as by an abstraction they are retrospectively analyzed."[9]

Unfortunately, James did not read these definitions, because they appear in the first installment of Blondel's article. When he saw the words themselves, it is strange that he did not remark about his own similar use of them, but simply put an exclamation mark after them and wrote: "Kierkegaard's formula."[10] This formula is: "We live forward, we understand backward."[11] James himself held that, "we live prospectively as well as retrospectively."[12] For James, our immediate life is full of the sense of direction, of the way we are going, and hence can be known concretely before the process is completed.

When philosophy is envisaged from the point of view of reflection as a technical discipline and speculative search, it begins only when, instead of attaching itself successively to partial data as if they were isolable and positing independent problems with regard to distinct objects as if they were solvable separately, it expressly subordinates its whole investigation to the unique and inevitable problem which the relation of consciousness and action raises in us. The first division of Blondel's article will be devoted to proving this proposition. The second division will show that when philosophy is envisaged from the point of view of prospection as a work of invention and practical

[8] *Ibid.*, 241.

[9] *Ibid.*, 242.

[10] *Miscellaneous Unbound Notes, F*[4], Harvard University Library. Permission to quote this source is gratefully acknowledged. All references to James will be from this source, unless otherwise indicated.

[11] W. James, *Essays in Radical Empiricism*, p. 132, note 1.

[12] *Ibid.*, p. 87.

direction, it begins only when, instead of limiting itself to a global intuition or to particular purposes, it learns and practices the duty of spelling out letter by letter the book of life which is written within us, in order to disengage its directive ideas, to attain and assimilate its component realites, and to foresee and prepare its denouement.

I

To achieve the first point of view philosophy must adopt what today is known as the phenomenological method: " Before every affirmation about the reality of our being and the objects which we think, it is first necessary to render an account of what we really are conscious of being and of what we think in fact." [13]

This means that we must unravel as completely as possible the continuous chain of thought without any realistic or idealistic prejudice. This method enables us to seize the bonds which assure the unity of our mental life. With regard to the non-self, " instead of pursuing behind the datum a fleeing phantom, we must discover in the datum itself a richness of reality which is always obscurely present." [14] James remarked in his notes: " these last words are the bad ones." They must be so for an empiricist who accepts as real only the actual experience of it.

If philosophy must begin with an " inventory of the given," an entirely different orientation and ambition result for it. Philosophy will no longer look to discover at the end of its regressions elements defined once for all, concepts with fixed contours, formulas which would allow us with the aid of these materials to reconstruct in theory reality considered as a closed system. Rather, it will seek to determine the meaning of movement and seek its fixity only in the orientation of its journey. This insistence on the plastic and dynamic character of the life of the mind and nature does not open philosophy to the charge of being pure freedom of thought, as we shall see. James

[13] " Le Point de Départ," 229. [14] *Ibid.*, 230.

paraphrased this section as follows: "Philosophy is not a formula for an ideal reconstruction of an origin complete in itself and past, of what is and is to be, but an active entrance into the direction of a movement that admits of no static definition."

Blondel's contribution to the solution of the problem of knowledge is the suggestion that, "To the deceiving problem of the relation of ideas to objects must be substituted the entirely different problem of the relation of our thought and action, of our actual knowledge and the implicit state which it supposes and prepares."[15] Here James wrote: "implicit is bad." For him, action must be something explicit, because it is as it is experienced to be. Its *esse est percipi*.[16]

What is primarily given is not the dualism of ideas and external objects, but the immanent inadequation of actual thought and action on its way to self-realization and reflection. For the notion of an incurable relativity Blondel would substitute the notion of internal inadequation. Hence, the unknown x to be determined with precision is not an object but ourselves.

> To designate this *mélange* of obscure virtualities, conscious tendencies, and implicit anticipations, the term 'action' seems well chosen. For, it comprehends both the latent power, the known realization, and the confused presentment of all which in us produces, enlightens, and attracts the movement of life. Philosophy begins when it expressly proposes to study this interior inadequation in order to tend to a progressive coincidence of the implicit and the explicit.[17]

This is obviously a very different use of the term "action" than is commonly supposed. Hence, we must not take this word to mean an entity, seen from without, in its opposition to thought. Action is the reality already contained in us, the

[15] *Ibid.*, 234.
[16] W. James, *op. cit.*, p. 183.
[17] "Le Point de Départ," 234-235.

positive aspiration which stimulates the development of distinct thought and moral life in each person.

The reason why philosophy is not subject to the charge of being pure freedom of thought in taking action as its proper object of study is that, " There is in the one and total action which constitutes our person an internal principle which orientates, commands and judges fragmentary thoughts and acts." [18] Blondel called this principle the *volonté-voulante,* which desires in a fundamental, general and absolute manner. It is opposed to the *volonté-voulue,* which desires in particular in each given case by choice. His thesis *L'Action* used a dialectical method to determine, rectify and reduce to identity the relation between these two wills. This method does not lead philosophy to an irrational position, because this prime orientation is governed by a logic which is as intelligible as is formal logic.[19]

In 1902 Blondel publicly proposed the term " Pragmatism " to designate his philosophy of action. A few years later he emphasized his wish that it designate the aspect of the general problem of knowledge described above " to place himself outside of the revolving cage of idealism and realism." [20] He also pointed out that:

> In England and America the word 'pragmatism' designates less the prior and critical task which Blondel envisages than the doctrine that secular practice and experience serve as a concrete criterion for truth which is measured by its practicality and utility . . . but it does not suffice to insist on such a criterion, if a principle of fixed orientation and progressive adaptation is not sought.[21]

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[18] *Ibid.*, 235.

[19] M. Blondel, " Le principe élémentaire d'une logique de la vie morale," *Bibliothèque du Premier Congrès international de Philosophie de 1900,* II (Paris, 1903) 51-85.

[20] B. de Sailly, " Les Ingrédients de la Philosophie de L'Action," *A. P. C.* I (1905) 188.

[21] *Ibid.*, 188 and 192.

To take as the formal and specific point of departure for philosophy the systematic affirmation of our actual inadequation and of the solidarity of all the problems which concern our being and beings does not lead to solipsism. For, "from the apparent to the integral self there is an infinite to be crossed and filled. To equal and possess myself I have to put the universe and God in this need of being, of eternity and of happiness which constitutes me." [22] Hence, a necessary correlative to the notion of immanence is the notion of transcendence. We seek and find ourselves truly only in union with the whole.

It is understandable that James did not make any jottings from this section. In the light of his constant effort to find empirical arguments against the "absolute" of the rationalists, the word "transcendence" had a very limited meaning for him: "Radical empiricism accounts for self-transcendency as a process that occurs within experience, as an empirically mediated thing." [23] He could not accept a transcendent which would be an actual infinite, because this seemed to him to militate against the possibility of novelty in the universe.

But does this not constitute a difficulty for Blondel also? Before affirming anything as positive, are we not forced to try to exhaust the inexhaustible? No, because:

> My purpose is not to construct a closed system or self-sufficient theory, to try to absorb the infinite in a fixed formula, or to 'buckle' theory and practice. It is a question of furnishing to practice the orientation, light and verification useful to the unified progress of thought and life.[24]

II

After having shown the relation between thought and action, Blondel shows how reflection helps solve the problem of life and how thought is related to reality.

[22] "Le Point de Départ," 237.
[23] W. James, *op. cit.*, p. 239.
[24] "Le Point de Départ," 238.

He admits the axiom *primum vivere, deinde philosophari* to be true, if it means that to be born reflection has a prior need of spontaneous activity. It is false, if it means that philosophy is limited to enlightening afterwards what is already complete without it, because philosophy is inserted there and adds to it. Knowledge is not a simple tracing or supernumerary reproduction of being. Science and practice are not bound together only by an external relation of idea with its object, of the application with its principle. In fact, knowledge constitutes an effective progress. It realizes a form of existence which would not be without it, but a form of existence which becomes an integrating part, "because it is a normal expression and an essential condition of the development of our being and of the truth of beings in us." [25] James noted: "because it grafts itself harmoniously, supplements and completes without in any way negating, I should say. Blondel still uses the notion of implicitly contained." The meaning of this last sentence is not clear. The word "still" evidently refers to James' former objection to considering action as an implicit state. Here he interprets Blondel as saying that thought is implicitly contained in action, whereas "it grafts itself etc."

Later James better realized the point Blondel was making, because he is in almost complete agreement with the text which immediately followed the above quotation:

> We must use what we are and have to know, and use what we know to be and have more, although in this alternating propulsion, as that of a wheel which turns by advancing, the cycloidal cannot be achieved in a circle, i. e., speculative reflection and practicing prospection cannot overlap and coincide in this life.[26]

> The incompleteness of the pluralistic universe . . . is also represented as being self-reparative through us, as getting its disconnections remedied in part by our behaviour. "We use what we are and have

[25] *Ibid.*, 241.

[26] *Ibid.*, 241.

to know and what we know to be and have more." Thus, do philosophy and reality, theory and action, work in the same circle indefinitely.[27]

In another part of the same work James wrote,

Philosophies are intimate parts of the universe, they express something of its own thought of itself. . . . Our philosophies swell the current of being, add their character to it. They are part of all that we have met, of all that makes us be. As a French philosopher says, "nous sommes du réel dans le réel." Our thoughts determine our acts and our acts redetermine the previous nature of the world.[28]

The French philosopher is not identified but, of course, he is Blondel who wrote, continuing the above text,

Philosophy initially looks not only to explain our life but also to make it; not only to express beings but to incorporate and assimilate them. It is of the real in the real. It is not orientated backwards, aside, or outside; it goes in the direction of the current; it mingles there and enlarges it; it is something of that which makes us be.[29]

What is the realistic value of thought according to Blondel? This question arises in his effort to steer a middle course between idealism and the intuitionism of Henri Bergson.

Bergson claimed that reflection is only an artifice at the service of action. The method of philosophy is to return, after reflection, to the integral plenitude of intuition. But, Blondel observed, this would enslave knowledge in its triumph, because, as Bergson himself wrote, "to perceive all the influences of all the points of all possible bodies would be to descend to the state of the material object."[30] On the contrary, Blondel held that, "If one tried to ignore discursive thought to know the real, one would end up in the unreality of thought and the unintelligibility of being. We must traverse the domain of objective knowl-

[27] W. James, *A Pluralistic Universe*, pp. 329-331.
[28] *Ibid.*, pp. 317-318.
[29] "Le Point de Départ," 242.
[30] H. Bergson, *Matière et Mémoire* (Paris, 1896) pp. 38-39.

edge, not to lead it back to its source, but to conduct it to its confluence with life." [31]

James, too, is subject to this same criticism, for he maintained that, "The maximal conceivable truth in an idea would seem to be that it should lead to an actual merging of ourselves with the object, to an utter mutual confluence and identification." [32]

The middle course, then, is to realize that thought will engender true knowledge by uniting itself to particular actions. By acting according to our reflective ideas and objective knowledge our thought will equate more our being and beings. Far from tending either to reduce prospection to reflection as if the concrete were made with the abstract (idealism) or to sacrifice discursive thought to intuition as if the work of science were only a provisory artifice (Bergson), philosophy consolidates these two movements of living thought. From their mutual dependence results a conception of reality which "is made of the synthesis of multiple relations which discursive reflection analyzes and which intuition, which is its final cause and *raison d'être,* expresses in its superior truth." [33]

To the initial question, therefore, it seems legitimate to reply that,

> Philosophy is the integration, special and technical by its form, universal and popular by its matter, of the hierarchized efforts of human life to realize our being by realizing beings and being in us, i. e., by knowing them, by adapting to them, by assimilating them.[34]

Blondel has written that James wrote to him for a copy of his *L'Action* "after having read Bergson." [35] But Bergson did not refer to this book in any of his writings, to my knowledge.

[31] "Le Point de Départ," 244.
[32] W. James, *The Meaning of Truth* (New York, 1909) p. 156.
[33] "Le Point de Départ," 246.
[34] *Ibid.*, 249.
[35] Frédéric Lefèvre, *L'Itinéraire philosophique de M. Blondel* (Paris, 1928) p. 48.

Nor does "Le Point de Départ" refer to *L'Action*. In any event, James wrote on November 25, 1907:[36]

My dear Sir,

I have vainly tried to procure a copy of your book *L'Action*, which I require to read for purposes of my own. It is out of print and no library in this neighborhood has a copy. The audacious plan has occurred to me of writing directly to you to ask if you know of some idle copy which I might buy of its proprietor, or, failing that, if you could be so very obliging (and trouble-taking) as to send me a copy by mail which I would return after reading.

You have struck a magnificent note in the *Annales de Philosophie Chrétienne*. I have copied whole pages of your words.

Another letter from James, January 7, 1908, reveals that Blondel sent him his one and only copy of *L'Action* in addition to some of his pamphlets.[37] A final letter of James to Blondel is the most significant in establishing the personal and philosophical relationship between these two men:

February 24, 1908

Your very friendly letter of the 12th. arrived today just as I am getting ready to wrap up your precious volume and send it back. I have already kept it too long, I fear, but for four weeks an attack of influenza so weakened my brain that I was unable to understand anything serious at all, so I have just finished reading *L'Action*.

Reading, yes! but *understanding* is another matter! The reading had to be rapid, but I doubt whether one reading, even a very slow and careful one, would enable me to reproduce in myself the exact course of your thought. Altho' we come out with very similar results, you will have seen, from the mere look at the pages of my "Pragmatism" how very different the step, the *allure*, [gait] of my thought is from yours.

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[36] *Blondel Archives*, Aix-en-Provence, France. Permission to quote the following three letters is gratefully acknowledged. No system of reference was forwarded.

[37] These pamphlets most likely were: M. Blondel, "Le Christianisme de Descartes," *Revue de Métaphysique et de Morale*, IV (1896) 551-567; "L'Illusion idéaliste," *ibid.*, VI (1898) 727-746 (where a definition of "intellectualism" is given, a term James used in his later writings).

I find it terribly hard to *emboiter le pas* [to come to grips] with your writing. In spite of the rare felicity of much of your expression, you remain to me *esoteric.* I feel that a whole human *life,* intellectual, practical, moral, and religious, expresses itself through your formulas, but to me they are so abstruse and complex as to be almost a foreign tongue. I will not attempt to *débrouiller* [unravel] the differences and difficulties which I have found in details. To do so properly, I should have to *piocher* [study very hard] the book and read it several times. At present you belong for me to the race of absolutely original, probably prophetic, thinkers with whom one feels that one must some day settle one's accounts. I do hope that you will soon recover from your (abominable) neuritis and print your second edition before long. Also revise it in the sense of *simplification* rather than the other way. Your article in the *Annales* was so clear!

Once more, dear Professor Blondel, I thank you for your extreme courtesy and trust in sending me your sole copy.

The phrase "we come out with very similar results" refers to the last chapter of *Pragmatism* entitled, "Pragmatism and Religion." This, however, was not Blondel's opinion. Years later, in pointing out his position with regard to the opinions of his contemporaries, he recalled this letter of James:

I expected this avowal of difference from him. While professing a *Pluralism,* very adverse to my *unitary* design, James, contrary to all my efforts, gathers and notes religious data uniformly on the plain of empirically knowable facts. He does not suspect that it could or should be otherwise. He does not perceive that the secret of destiny cannot be sought with impunity by a search into the things of time and space. He does not sense that a solution, found by such an extension of phenomenal experience, would be the very negation of what one hoped to discover in this way. If there is a religious life and higher existence, it supposes not so much a prolongation as a change of state; not so much a subliminal depth of natural forces as a spiritual ascension and moral transfiguration, whose reality no positive observation of the sense or science can disclose.[38]

Blondel was, indeed, an "original" thinker. So much so,

[38] F. Lefèvre, *op. cit.*, pp. 49-50.

that it took much effort and time on his part to make his contemporaries see that action carries with it an immanent logic (that of the norm which directs it) and that action is an initiative and has a properly noetic value. However, James was not alone in his experience of difficulty in understanding *L'Action*. As with anything "prophetic," it is more clearly seen in retrospect than prospect.

Loyola College,
Baltimore, Maryland.

Notes on the Authors

Rev. Dr. Benedict W. Ashley, O.P., *is a member of the Albertus Magnus Lyceum for Natural Science and has taken a leading role in the curriculum studies at St. Francis Xavier College in Chicago. He is the author of a forthcoming book in logic.*

Rev. Dr. Frederick J. D. Scott, S. J., *has taught at St. Joseph's College, Philadelphia, and is at present in the philosophy department at Loyola College. He holds his doctor's degree from Georgetown University, Washington, D. C., where he did a thesis cognate to his present article.*

Dr. Thomas D. Langan *completed his doctoral work at the Institut Catholique of Paris. During 1955 he participated with leading French philosophers in a seminar given in 1955 by Prof. Heidegger on the occasion of his first stay in France.*

Mr. Joseph Sikora *has completed his work for the doctor's degree at the University of Notre Dame and teaches at Loyola University. His special field of interest is the philosophy of science.*

Dr. W. K. Wimsatt, Jr., *did his graduate studies at Georgetown and at Yale. He is the author of several books and a number of papers, and co-author with Cleanth Brooks of the recent*: Literary Criticism: A Short History.

Transcendence in the Philosophy of Heidegger

by Thomas D. Langan

MARTIN HEIDEGGER declared recently that his efforts to date have been directed to that proper posing of the question, " What is the ' being ' of the things that are (*das Sein des Seienden*)," proposed in *Being and Time* [1] as *the* ontological question, and to saving the inquiry which it invokes from lapsing into the traditional, metaphysical error: the mistake of conceiving being after the nature of one of its aspects.[2] In other words, Heidegger does not intend that the works since *Being and Time* should be taken as an answer to the being-question (*Seinsfrage*); and what is more, some of his very recent statements leave completely ambiguous even the *possibility* of the fundamental question's being answered.[3] Critics of *Being and Time* have bluntly asked, " Is Heidegger precluded by his basic position from *ever* answering it? "

The question challenges us to inquire into the ontological status of the Heideggerian philosophy. Both in the basic work, *Being and Time,* and throughout the works posterior to it there is a constant flow of comments on the manner of approaching being, on the nature of being's revelation, on the horizon within which the being-question must be asked, on what the being-question is not, all of which suggest the influence of some general conception, if not of being, then of the being-problem. It is the general complexion of this conception which must be

[1] M. Heidegger, *Sein und Zeit*, 7th ed. (Tübingen, 1953). The pagination is the same in the original edition of 1927.

[2] Heidegger's recent resume of his own results is discussed in my report in *The Modern Schoolman*, XXI (1955) 114-118.

[3] *Vorträge und Aufsätze* (Pfullingen, 1954) p. 78.

investigated if we would determine the ontological status of the original conception and its subsequent developments.

I have selected to follow the development, through several key works, of the notion of transcendence, not only because it has naturally played a pivotal role in this development, but because I believe that Heidegger's failure to develop sufficiently this basic notion on one of its levels of possible meaning, reveals most clearly a handicap under which this philosophy has been kept from bearing all of its potential ontological fruit.

The notion of transcendence is most central in the analysis of 1929, *On the Essence of Fundament* (*Vom Wesen des Grundes*). The formulation there appears already in essential outline in *Being and Time* and is presented as the terminal notion in *Kant and the Problem of Metaphysics,* which is slightly anterior to *On the Essence of Fundament.* After examining the notion of transcendence in the latter work, where, we shall see, it appears basically as *horizon*—an emphasis that we shall criticize, thus opening the discussion to a more general analysis of transcendence on all its three planes of meaning—we shall pass to the indications of transcendence in works that come later, which themselves seem to be trying to move beyond the optics of the original conception. But it will remain to be asked if the limitations of the original conception have indeed been overcome sufficiently to make us optimistic about the possibilities for the development of Heidegger's philosophy as a "fundamental ontology."

Heidegger accepts from Kant the notion that the fundamental factor in human inquiry is the horizon within which it must unfold, and that the horizon is determined by the nature of the *Dasein* itself.[4] This conviction is basic in *Being and Time.*[5] It

[4] *Da-Sein*, the being-that-is-there, the ex-sistent, the term reserved for the human existent whose "being-there" forms a world within which there can *be* something. Cf. *Was ist Metaphysik?* 5th ed. (Frankfurt, 1949) p. 13, and Henri Birault's article in *Phenomenologie, Existence* (Paris, 1953) p. 142n.

[5] *Sein und Zeit*, pp. 52-59.

is explored directly and against its full historical background in the work which follows soon after, *Kant and the Problem of Metaphysics.* In *On the Essence of Fundament,* it is the non-Kantian aspect of his position, however, which Heidegger wishes to underscore. He explains how he has been able to maintain within the frame of a Kantian conviction that the *Dasein's* determination of the world's horizon is the starting point for understanding the nature of the reality within which we find ourselves, *a basically non-idealistic direction.*

Indeed, for the Heidegger of *On the Essence of Fundament* the first and most important meaning of transcendence is akin to the Kantian notion: the horizon of the world is the *Dasein's* own horizon, to the point in fact that the *Dasein* itself is essentially defined as being-in-the-world (*In-der-Welt-Sein*).[6] But in accepting from Kant that which can hardly be denied, namely that the limits of the human *situation* are the limits of the human *being* itself, Heidegger does not accept the constitutive idealism which prompts him to brand Kant the last of the great metaphysicians—metaphysics being understood as the historical, unsuccessful issue of a quest for 'being' begun in a wrong direction.[7] *Being and Time,* it is true, left many readers with the opposite impression. When this work declared that the world is neither an existing thing, nor the sum-total of things that are, but the horizon within which the things that are come to be, and that this horizon is the time-founding projection of the *Dasein,* some concluded too hastily that this conception of "world" differed little from the Kantian idea of pure reason. Was not time itself grounded in an analysis of *Sorge* (Care), which in turn was explained as the *Dasein's* reaction to the things that are?

On the Essence of Fundament reaffirms transcendence as the

[6] "Vom Wesen des Grundes," in *Jahrbuch für Philosophie und phänomen. Forschung,* VIII (1927) 83-84.

[7] *Sein und Zeit,* pp. 19-26.

power of the *Dasein,* that is, as the *Dasein's* fundamental constitution anterior to all comportment; transcendence itself, in other words, is identified and defined as the fundamental structure of the existent, the constitution of the selfhood (*Selbstheit*) of the human existent. In affirming that the world within which things come to be is founded in the transcendence of the human existent, and that this transcendence is the very "selfhood" of the human existent itself, Heidegger reaffirms the basic position established in *Being and Time.* But it is at precisely this point that he demonstrates his ability to accept the Kantian notion of a human horizon without interpreting that horizon in terms of a constitutive idealism. He rejects such an idealism as the final and deadly fruit of a metaphysical tradition which, in opposing an object and a subject across an epistemological abyss, is required to reunite them by forcing the conformity of the one to the other. The rejection of an idealism for such a reason naturally entrains as well the rejection of a "realism" which would be its opposite, the conformity of the "subject" to an independent object. Actually, in the final analysis, it is the *Dasein* who knows; without its knowledge there *is,* literally, nothing; hence the edge, in such a game, would be given to idealism. But the idealism-realism argument is pointless. Heidegger rejects the epistemological conception of the question as a falsification of the givens of the knowledge situation. And while recognizing the validity of the insistence that it is across the limits of the *Dasein's* view that the horizon of our "world" is formed, Heidegger attempts a fresh, "concrete" reformulation of the terms of the "world" problem.

Concretely, the "world" problem is the problem of the relation of the *Dasein* with the things that are. The moment the problem is posed in these terms it becomes clear that the explanation must center on an effort to determine what it is that sets off the *Dasein* in its own characteristic selfhood from

the other things which populate its world. Before there can be "the other" there must be the self; the "you," to have meaning, must be related essentially to, and be constituted in its "you-ness" by an "I." The fundamental *concrete* question becomes, then, to know how the "I-ness" (*Selbstheit*) of the *Dasein* is constituted.

First it must be underscored again that the self is not, in the classic sense, "subjective," nor the world "objective." The *Selbst* is not a self-contained nodule wrapped up in magnificent isolation from the rest of the things that are. And the world is not a great object set off in isolated opposition to the subject which seeks to know it. In fact what we must seek concretely is the *relation* which makes all "subjectivity" and "objectivity" possible and is, therefore, anterior to both. This relation is a transcendental dependence and a mutuality of origin on the part of the self and the world, a reciprocal participation in the same act of constitution.

The "world" and the *Dasein* come to be together, as the result of the same act. The *Dasein* finds itself in finding the "world," and the "world" comes be in the *Dasein's* finding of itself. The *Dasein* provides itself its *original configuration* as a self in giving the "world" its original configuration as the horizon of the things which the self knows. In knowing the things of the world, the self finds itself *as their knower.*

It is thus that Heidegger avoids a constitutive idealism. The *Dasein* does not create the things that are, rather it projects itself among them, and finds itself in finding itself *there*—finds itself in providing that relation of itself to the things that are which we call "the world." The "to be" of the things that are is, then, a "to be for the *Dasein,*" that is, a "to-be-in-the-world," and, reciprocally, the being of the *Dasein* is to be among the things that are, and this within its own horizon, which is, precisely, its rapport with the things that are; the *Dasein's* being is being-in-the-world (*In-der-Welt-Sein*).

In the culminating definition of "transcendence," found in *Von Wesen des Grundes,* namely that transcendence is the *Geschehen der Entwurf des Daseins* (the event of the human existent's pro-ject), lies the key to two important characteristics of this analysis of transcendence: a) its tendency, because of its insistence upon transcendence on "the Kantian level" of transcendence, i. e., in terms of the human horizon, to underemphasize a more fundamental transcendence, that of the things which appear within this horizon; b) again as a result of the original Kantian optics of the Heideggerian conception and despite the success of his efforts to liberate himself more and more from a Kantian background, the quest for being is cast into a traditional generality which obscures the reality of a third and ultimate transcendence upon which both the *Dasein's* transcendence and the existential transcendence of the things that are depend.

The first of these two objections amounts to charging that this definition of transcendence is not sufficiently loyal to *the phenomenological awareness of the factuality of existence.* This phenomenological awareness, in fact, much more than the form of the final definition given above, characterizes the real effort of that research. The definition, however, despite the fact that it is arrived at by this basically non-Kantian, phenomenological movement of thought retains a Kantian sound.

Because it is the non-Kantian movement of thought, and not the Kantian cast of the problem which prevails, the notion of transcendence formulated primarily as a condition of the *Dasein,* while never overthrown, is destined to fade as the center of interest. This explains why one feels, already in the earliest works, a disproportion between Heidegger's existence-centered phenomenology and his conception of transcendence in the general terms of a universal horizon. This formulation of the notion of transcendence seems to pertain to the past of a philosophy that is already discovering its future. For the basic

movement of the thought in *On the Essence of Fundament* affirms that it is *not* the horizon of the *Dasein,* it is not *this* transcendence which is fundamental; rather *within the horizon itself* we discover something that is more revelatory of the "really-real"—*the factuality of existence itself.* For the great affirmation of this work—and here again it only roots deeper what is already born in *Being and Time*—is the realization that there is nothing more basic than simply *to be.* The fact of the *Dasein's* horizon is a result of the fact that the human knower *is* in this way. He *is* in such a way that being lies open to him, and *in* lying open to him becomes more fundamental than the fact of this openness, which in *fact* depends on it, as we depend on the openness to discover existence in its factuality. Following the discovery that the transcendence of *being-in-the-world* puts the *Dasein* among the things-that-are, it is the being of these things-that-are that becomes fundamental and important. It is *this* transcendence, (the transcendence of existence)—transcendence in the sense of independence from an idealistic constitution by the *Dasein,* which is discovered at the base of the *Dasein's* factuality and provides the foundations (*Bodennehmen*) for the *Dasein* in its essential act of grounding (*grunden*) a world. That is why the later works seem to turn to explore in a new direction the conditions of our original contacts with being in its fundamental givenness.

As Heidegger explores phenomenologically within human comportment the origin of the *Dasein's* ability to found a world, he encounters the ultimate brute fact upon which this comportment depends, the *Dasein's liberty.* The center of the unity of the dispersion of things that are, the center of transcendence in the first sense, is the *Freiheit* of the *Dasein.* But this liberty itself is discovered to be an *abyss*—not only the *Grund* of the world's foundation, but its *Abgrund*: this liberty itself depends for its very being on the factuality of the things that are. The

liberty of the *Dasein* can only found (*gruden*) the world because it itself finds its foundations (*Boden-nehmen*) among the things that are. The *Grund* is an *Abgrund* (abyss) because the *Grund* itself must find a ground in the factuality of existence.[8] That which is most ultimate in the *Dasein* and upon which the constitution of a *Welt* depends—the very fact of its existence—is itself dependent, factual; it is namely the *fact* that the *Dasein* finds itself among the things that factually are. Thus the *Dasein's* freedom will ultimately be defined[9] as the *Gelassenheit des Seinslassens*—as a "letting-be" of the being of the things that are.

Thus the justification for the suggestion offered above: The "transcendence" of the Kantian tradition, the "transcendence" explored from *Sein und Zeit* to *On the Essence of Fundament* is only a moment of a more fundamental and more original transcendence, the factuality of existence with all of its implications. This discovery will motivate the Heidegger of *On the Essence of Truth* to define the *Dasein* as the existent for whom Being reveals itself in the Unveiledness (*Unverborgenheit*) of truth, rather than insisting on the *Dasein's* pro-jection of a world within which the unveiling takes place. Not that this conception, certainly valid, of the human horizon of the revelation of truth, is abandoned; rather, as we said before, it is *surpassed* in importance by a movement which plunges within *the horizon* to explore the nature of the yet more fundamental revelation that takes place there. It is a revelation whose fundamentalness overshadows the once seemingly so important role of the transcendental horizon. It is the revelation of a

[8] *Vom Wesen des Grundes*, trans. in French H. Corbin (Paris, 1951) p. 98. The reader is here referred to the French translation for the light that it throws on a text rendered otherwise very obscure by Heidegger's maximum exploitation of the intricacies of the German language.

[9] *Vom Wesen der Wahrheit*, 3rd ed. (Frankurt, 1954) p. 14. English trans. in a series of Heidegger's essays published as *Existence and Being* (London, 1949) pp. 317-352.

transcendence of existence which reverses the poles of dependence and completes Heidegger's counter-Kantian revolution. It puts being at the base of everything.

But the Kantian dimensions of the original problem are not completely overcome. Manuel Levinas notes[10] that for Heidegger the intelligibility of the individually existing thing resides in its factuality, its independence, but that the articulations of the vision which is the rapport of the subject with the object are subordinated to the rapport of the object with the "light" which is the illumination of the truth. This prompts Levinas to make the following important comment:

> The intellectual grasp of the existing thing consists, then, in going beyond (*au delà de*) the existing thing—beyond precisely to the *ouvert*—where the existing thing is viewed in the horizon of being. That is to say that the comprehension (of being) in the thought of Heidegger rejoins the great tradition of occidental philosophy: the understanding of the existing, individual thing in a movement beyond the particular—understanding takes place by putting oneself in relation with the individual thing which alone exists, but by means of a knowledge which is always a knowledge of the universal.

Levinas rejects this tendency by reaffirming the real priority of the concrete existing thing. This he does, experientially, by reaffirming the givens of the most ineffable of "concrete" situations, our intimate contacts with another human being. There it is not a universal consideration, a "light" or the like, which is ultimate, but the "personality" of the individual thing in the density of its own proper act of existence.

Levinas' criticism is basically just. Side by side with the awareness that every phenomenological analysis must arrive at an encounter with the brute existence of the things that are, another current of Heidegger's thought manifests a conception of being as a general form, vague as the Plotinian One, as

[10] M. Levinas, "L'Ontologie est-elle fondamentale?" in *Phénomenologie, Existence, op. cit.*, pp. 194-203.

indefinite as the Platonic Good, a kind of Great Light which spreads its illumination over the things that are and, while being none of them, while being no-thing, while, properly speaking, not being at all, brings all to be, reveals itself in all that is, ensconces itself furtively in being, stands open stealthily to the poetic activity (*Dichten*) which captures it in *Sprache,* but a light which in unveiling itself veils itself, in illuminating all remains hidden in the shadows. Not that this conception is without value. It manifests a vivid awareness of the fundamentalness and transcendent mystery of the ontological fundament of all things, and thus protects the "fundamental ontology" from the traditional "metaphysical error," the dissipation of being by identifying it with one of its determinate aspects (*Seiende*). But does the fundamentalness of being and its transcendent mystery, to avoid being identified with a particular *Seiende,* have to be expressed as something grounded in non-particularity? Does the rejection of the limitations of *Seiendheit* involve the rejection of every aspect of the *Seienden,* of every condition of their being? Since it is only *through* the *Seienden* that we know their prior, fundamental ontological base—*das Sein*—*das Sein* itself must be represented in the *Seienden* by some moment of its existence, some aspect, the least essentially limiting, which would be precisely the term and result of this participation. To equate *Seiendheit* simply with limitation is to cut every line of the *Seienden* with *das Sein* which is its more perfect ontological expression. It is to render baseless Heidegger's fundamental expression of the analogical dependence of the *Seienden* upon *das Sein* and of *das Sein's* revelations in the *Seienden*: being never manifests itself essentially without the things that are, and a thing can never be without being (*das Sein nie weist ohne das Seiende, dass niemals ein Seiendes ist ohne das Sein*).[11]

[11] *Was ist Metaphysik?* p. 46.

What is lacking in Heidegger's philosophy is a fundamental phenomenological analysis of the conditions of *Seiendheit* in relation to the unlimited existence of its ontological ground, *das Sein.* Up to now such an investigation, vital to the further development of the fundamental ontology, has been blocked by the basic difficulty of the Heideggerian program: the unresolved tension between the general Kantian optics according to which the *Seinsfrage* is conceived and the concrete phenomenological method according to which it is investigated.

The opposition and tension between a general notion of being and the concrete encounter which has been the issue of every phenomenological analysis has its origin in the collision of several developments very difficult to reconcile: a) The "anti-metaphysical" conviction that historically philosophers have always reduced being to one of its aspects; this has installed at the basis of Heidegger's thought a negation of limiting particularity. Being is not the monopoly of any one thing, not even God, for all things *are,* nor is it to be explained by any one aspect, neither *Idea,* nor *energeia,* nor *existentia,* nor *Wirklichkeit,* nor *Vernunft,* for all of these are *of* being, and none of them is simply being. The "fundamental ontology" must be liberated from the limiting particularism of traditional metaphysics. But what is the opposite of the particular? Naturally, the *general.* Hence the very foundation of Heidegger's thought becomes *anti-particularist* before the conditions of particularity have been submitted to a thorough phenomenological investigation. b) The Kantian optics which, invoked by the anti-particularism, turn the gaze in a formal, general direction. Each of Heidegger's investigations from *Being and Time* to *On the Essence of Truth* has been a search for a general form: in *Being and Time, Zeitlichkeit* was explored as the ground of being; in *Kant and the Problem of Metaphysics,* the transcendent horizon; in *On the Essence of Fundament,* the nature of a

transcendent fundament as horizon; in *What Is Metaphysics?* the *Nichts* as the negation of the particularity of the *Seiendes* and therefore as the opening up to the generality that is *Sein;* in *On the Essence of Truth* the general revelation, the ideal light which is *Sein.* c) But each of these investigations was pursued with a phenomenological method that has led invariably to the encounter of the concrete, existential foundation of each of the situations investigated; *Zeitlichkeit* was founded in the *Sorge* (care) of the *Dasein*; the transcendent horizon in its freedom, and the *Nichts* in the radical contingency of the *Dasein's* finitude; and most fundamental of all, truth, like the horizon, is the "letting-being-be" (*Seinslassen*) which is a function of the *Dasein's* liberty. Further, each of these analyses discerned the dependence of the discovered concrete situation upon the factual existence of the concrete things that are.

This tension of Kantian optics and anti-particularist predisposition with the concrete issue of the phenomenological method does not result in open contradiction. The anti-particularism, insofar as it is *positively* stated, has led only to a very justifiable condemnation of historical metaphysical positions. The Kantian optics have only defined the *object* of the ontological quest but have not dictated the positive results thus far attained. Rather these have been the legitimate fruit of the phenomenological method employed. No, the opposed elements have worked their damage in another, less obvious way: a) Heidegger's anti-particularism—the result of an insufficient phenomenology of limit and actuality in the concrete—has tended to oppose the concrete and the universal with the suggestion that it is the *concrete* which is limiting and the universal which is open and free. b) This misplacement of existential priority, coupled with the "horizon optics," has simply prevented the profound phenomenological analyses from achieving *ontological* fruition. Each quest—"horizon motivated"—has led to the

encounter of a concrete, existential fact. But then the universal optics has intervened. How can a dense, concrete factual situation be the fundamental revelation of the "light" itself? What, for example, can freedom reveal except the dependence of the human existent, and all of the things that are, upon something other than these concrete existents of our experience? Indeed does not *das Sein* in revealing itself (in the *Seiende*) essentially hide itself?

To be sure, the existential foundation of the things that are is *transcendent,* and here the reality of a third and ultimately fundamental notion of transcendence comes into its own: *das Sein* reveals itself only in founding the limited, particular things of our experience, it reveals itself as the ground and source of that within the *Seienden* which is not limiting, that which is not in itself essentially "particular" in the restrictive sense but *actual,* dense in the concreteness of its existential reality.

And the assertion that *das Sein* "hides itself," that it transcends in its essential nature our direct knowledge, does not justify the assumption that *das Sein* cannot be explored phenomenologically *through* the partial revelations of the *Seienden.* The question should be rather *how.* As long as the "general form mentality" prevails, however, such an investigation would rather take the form of seeking amidst the partial "particularities" of the various *Seienden* and the various metaphysical positions which have tried to explain reality from the viewpoint of one of these *Seienden,* a kind of "sum-total" or "common denominator"; such an effort leads ultimately only to a negative conclusion—*das Sein* itself is none of these things.[12] Only a phenomenological examination of the conditions of concrete

[12] In other words, this would be the issue of a critique of historical metaphysical positions which itself failed to transcend the level of metaphysics. *Was ist Metaphysik?* clearly spells out the dominant role of *das Nichts* in such an insufficient analysis.

existence itself—of the lack of self-sufficiency of the various *Seienden,* for they are not their own explanation; of the nature of the concrete relation existing between things; of causality as the transmission of concrete existence; of the limitations of existence in particular things—only a continuing meditation in this concrete, phenomenological direction can positively reveal something of the nature of the fundamental transcendence. It is the proper phenomenological exploration of the exact conditions of the ultimate transcendence which the Kantian optics and anti-particularism of the Heideggerian analysis has tended to impede.

Hence, though each of the analyses from *Being and Time* to *On the Essence of Truth* has arrived at that grasp of reality in its fundamental concreteness which alone can serve as the starting point for the phenomenological analysis of the ultimate transcendence, each has been dropped precisely at that point; the horizon question on the contrary, has each time been subsequently reopened and phenomenologically explored from another direction. That is why the being-question remains as essentially unexplored *in itself* in *On the Essence of Truth* as it was in *Being and Time.*

Have the works published since *On the Essence of Truth* witnessed an effort on Heidegger's part to liberate himself from the horizon-optics and an insufficiently discriminatory anti-particularism? Some of the recent efforts have, in effect, contributed in this direction. Heidegger's interest in poetry as a concrete revelation of being could be interpreted as an analysis of being's way of revealing itself that is closer to the dynamic world of concrete things than the horizon analyses. Further Heidegger continues to affirm the necessity of overcoming the historical "forgetting" of the distinction between *Sein* and the *Seienden,* which amounts to an appeal to protect the ultimate transcendence. But both of these continuing tendencies are not

in themselves automatically liberating. If the poetic revelation of concrete being is dissolved in the general "light" of the horizon spirit, and if the overcoming of the "forgetting" is pursued in a manner that will frustrate rather than fulfill the phenomenological analyses invoked in its service, the general optics must continue to reign and no real progress toward a concrete ontology will result.

Heidegger is not unaware of the truth of what has just been said. He recently remarked that it is possible that the metaphysicians of the Western tradition have been staring so after the distant lightning of *Sein's* fading storm, that they have never turned to the earth on which they stand to study the *Seienden* which are directly accessible to us. For our part we will add that to turn too rapidly from a concrete phenomenological inquiry into the foundations of the *Seiendheit* of the *Seienden* is to miss transcendent being where it has left its causal traces for us to see.

That is the way to approach the *being-question; that* is the way to renew hope in a "surpassing" (*Überwindung*) of the forgetting (*Vergessenheit*) of the distinction between being and the things that are; *that,* and not the technic, which is only a definitive "forgetting," not only of the distinction, but of the *being-question* as well, is the way to achieve a definitive surpassing of metaphysics as Heidegger has defined it: a direct and determined attack on the question of the *Seiendheit des Seienden,* working out from the concrete facts of the human situation to a direct phenomenological analysis of the concrete things open before us in our experience; there examined in the depth of their concrete, causal functions and origins, the "*Sachen Selbst*," [13] that can undercut the limitations of the "horizon" formulation of transcendence and provide the footings for the ultimate transcendence. If such an investigation can

[13] "The things themselves," a phrase often used by E. Husserl.

supply for the original inadequacies of Heidegger's position, that is, if concreteness can be explored without being prejudged as equivalent with limiting particularity, then the notion of transcendence in the philosophy of Heidegger will be finally freed to move toward ultimate fruition. The two prior forms of transcendence will then find their true foundation in the ultimate, ontological, causal transcendence; for the grounding of the factuality of contingent existence in an existence which, while concrete, overrides and founds the limits of all particularity, will fulfill the basic program of a *concrete,* phenomenological philosophical structure outside of all arbitrary, metaphysical limits. This development will be the unmistakable indication that the philosophy of Heidegger has at last become the *fundamental ontology* by rooting itself firmly in being.

Saint Louis University,
Saint Louis, Missouri

Geocentricism in the *Syntaxis Mathematica*

by Joseph Sikora

REFERENCES are often made to the "Aristotelian-Ptolemaic cosmology." The cosmology of the *Divine Comedy* is supposed to be "Aristotelian-Ptolemaic." The cosmology of St. Thomas Aquinas is supposed to be "Aristotelian-Ptolemaic." It is not often realized that the cosmology of Aristotle is not at all the same as that of Ptolemy. The purpose of this paper is to show that, in fact, Ptolemaic geocentricism is a hypothetical interpretation of the appearances rather than the "evident truth" which geocentricism is in Aristotle's *De Caelo.*[1] In each system geocentricism is the doctrine that the earth is immobile at the center of a spherical universe.

Ptolemy presents his geocentric doctrine in the *Syntaxis Mathematica,*[2] in the fifth and seventh chapters of Book One. Chapter five is an attempt to show that the earth is in the center of the universe, while chapter seven is devoted to showing that the earth is immobile.

I. "Plausible" Character of the Arguments.

Before we begin to examine the arguments themselves, it would be well to look at a passage in chapter eight, in which Ptolemy speaks about these same arguments we are about to examine. The passage runs as follows:

> It will be sufficient for these hypotheses, which have to be assumed for the detailed expositions following them, to have been outlined here

[1] *De Caelo,* B, 14, 296a 24-297a 8.

[2] The critical edition of the *Syntaxis* is by J. L. Heiberg (Leipzig, 1898). The translations employed here are taken from the translation of R. C. Taliaferro, Vol. XVI of *Great Books of the Western World,* ed. R. M. Hutchins (Chicago, London and Toronto, 1952).

in such a summary way since they will finally be established and confirmed by the agreement of the consequent proofs with the appearances.[3]

We can see from this passage that the arguments which we are going to examine are not regarded as conclusive in themselves. Their purpose is to render the hypotheses *plausible;* these hypotheses are *established* only insofar as all the appearances can be fully accounted for with their aid.

II. Arguments Showing That the Earth is in the Center of the Universe.

In chapter five, Ptolemy begins by stating his general line of argument:

Now with this done, if one should next take up the question of the earth's position, the observed appearances with respect to it could only be understood if we put it in the middle of the heavens as the center of the sphere.[4]

The general form of the argument is quite clear—it is an attempt at verification by falsification. The hypothesis is to be shown true in fact by the exclusion of all other possible hypotheses. Letting h stand for the hypothesis and q for the appearances, we can express the argument symbolically:

$$\begin{array}{r} -h \supset -q \\ \underline{\qquad\quad q} \\ h \end{array}$$

Ptolemy sees only three other possible hypotheses:

If this were not so, then the earth would either have to be off the axis but equidistant from the poles, or on the axis but farther advanced towards one of the poles, or neither on the axis nor equidistant from the poles.[5]

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[3] *Syntaxis*, I, p. 26, lines 6-12 (Bk. I, Ch. 8). The references will be given first to the Heiberg Greek text, then to Taliaferro's translation.

[4] *Ibid.*, p. 16, line 20–p. 17, line 3 (I, 5).

[5] *Ibid.*, p. 17, lines 3-8 (I, 5).

Each of these hypotheses is discussed and refuted. The refutation of the first is accomplished with two arguments:

> . . . if the earth were conceived as placed off the axis either above or below in respect to certain parts of the earth, those parts in the right sphere would never have any equinox since the section above the earth and the section below the earth would always be cut unequally by the horizon. Again, if the sphere were inclined with respect to these parts, either they would have no equinox or else the equinox would not take place midway between the summer and winter solstices. The distances would be unequal because the equator which is the greatest of those parallel circles described about the poles would not be cut in half by the horizon; but one of the circles parallel to it, either to the north or to the south, would be so cut in half. It is absolutely agreed by all, however, that these distances are everywhere equal because the increases from the equinox to the longest day at the summer tropic are equal to the decreases to the least days at the winter tropic.[6]

> And if the deviation for certain parts of the earth were supposed either towards the orient or the occident, it would result that for these parts neither the sizes and angular distances of the stars would appear equal and the same at the eastern and western horizons, nor would the time from rising to the meridian be equal from the time from the meridian to setting. But these things evidently are altogether contrary to the appearances.[7]

Both arguments proceed in the same manner, beginning with the hypothesis in question, deducing the appearances consequent upon the hypothesis, noting that the appearances are otherwise, and concluding to the falsity of the hypothesis. The general logical form, in the same symbolism as above, is as follows:

$$\begin{array}{l} h \supset \quad q \\ \qquad\quad -q \\ \hline -h \end{array}$$

Though the logic of the arguments is irrefutable, we may question one of their presuppositions; and, indeed, Ptolemy

[6] *Ibid.*, p. 17, line 10–p. 18, line 4 (I, 5).
[7] *Ibid.*, p. 18, lines 4-11 (I, 5).

himself appears to deny it later on. This presupposition of both arguments is that the extremity of the heavens is not at a very great distance. The appearances that Ptolemy deduces from the eventually rejected hypothesis can only be deduced if the earth is of an appreciable size in comparison to the size of the heavenly spheres. This assumption is, of course, questionable; and, indeed, in the very next chapter, Ptolemy gives three arguments to prove that the earth has the ratio of a point to the heavens.[8] Two of these are very similar to arguments which we find here presupposing the opposite conclusion.[9] It is difficult to see how these two chapters could have been written by the same man. Perhaps he has merely compiled several arguments from quite different sources without regard for their consistency with each other. We may repeat once again that he did not regard these arguments as *conclusive*. They are merely to make his hypotheses *plausible*.

Next, against the second possible hypothesis, that the earth is on the axis of the universe but closer to one of the poles than to the other, Ptolemy adduces two arguments:

As to the second position where the earth would be on the axis but farther advanced towards one of the poles, one could again object that, if this were so, the plane of the horizon in each latitude would always

[8] *Ibid.*, p. 20, line 5–p. 21, line 6 (I, 6).

[9] *Ibid.*, p. 20, lines 5-12 (I, 6). "Now that the earth has sensibly the ratio of a point to its distance from the sphere of the so-called fixed stars gets great support from the fact that in all parts of the earth the sizes and angular distances of the stars at the same times appear everywhere equal and alike, for the observations of the same stars in the different latitudes are not found to differ in the least."

Ibid., p. 20, line 20-p. 21, line 6 (I, 6). "And that the earth is clearly a point also from this fact: that everywhere the planes drawn through the eye, which we call horizons, always exactly cut in half the whole sphere of the heavens. And this would not happen if the magnitude of the earth with respect to its distances from the heavens were perceptible; but only the plane drawn through the point at the earth's centre would exactly cut the sphere in half, and those drawn through any other part of the earth's surface would make the sections below the earth greater than those above."

cut into uneven parts the sections of the heavens below the earth and above, different with respect to each other and to themselves for each different deviation. And the horizon could cut into two even parts only in the right sphere. But in the case of the inclined sphere with the nearer pole ever visible, the horizon would always make the part above the earth less and the part below the earth greater with the result that also the great circle through the centre of the signs of the zodiac [ecliptic] would be cut unequally by the plane of the horizon. But this has never been seen, for six of the twelve parts are always and everywhere visible above the earth, and the other six invisible; and again when all these last six are all at once visible, the others are at the same time invisible. And so—from the fact that the same semicircles are cut off entirely, now above the earth, now below—it is evident that the sections of the zodiac are cut in half by the horizon.[10]

And, in general, if the earth did not have its position under the equator but lay either to the north or south nearer one of the poles, the result would be that, during the equinoxes, the shadows of the gnomons at sunrise would never perceptibly be on a straight line with those at sunset in planes parallel to the horizon. But the contrary is everywhere seen to occur.[11]

The logical form of each of these arguments is the same as that employed in destroying the first hypothesis. Both have the same questionable presupposition concerning the size of the universe as the preceding pair of arguments. The first of this latter pair assumes the stellar sphere to be at not too great a distance; the second makes the same assumption with regard to the sun.

Against the third possible hypothesis, Ptolemy says only the following:

And it is immediately clear that it is not possible to advance the third position since each of the obstacles to the first two would be present here also.[12]

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[10] *Ibid.*, p. 18, line 11–p. 19, line 8 (I, 5).
[11] *Ibid.*, p. 19, lines 9-16 (I, 5).
[12] *Ibid.*, p. 19, lines 16-19 (I, 5).

Now that all of the other three possible hypotheses have been eliminated, Ptolemy summarizes his argument:

> In brief, all the observed order of the increases and decreases of day and night would be thrown into utter confusion if the earth were not in the middle.[13]

But a further argument is added to make the hypothesis even more plausible:

> And there would be added the fact that the eclipses of the moon would not take place for all parts of the heavens by a diametrical opposition to the sun, for the earth would often not be interposed between them in their diametrical oppositions, but at distances less than a semicircle.[14]

This argument, however, is more burdened with questionable presuppositions than any of the preceding arguments. It seems to presuppose that the earth is motionless, wherever it is, and that the sun and moon revolve circularly around some point in the universe, wherever it is. But it remains to be shown that the earth is motionless; while the assumption regarding the motion of the sun and moon involves problems of its own, since Ptolemy himself admits that the motions of the heavenly bodies, although simple in themselves, may require a complex set of circles for their representation to us,[15] that is, may not simply be circular motions around some point in the universe, whether at the center or elsewhere.

To summarize our criticism of this chapter of the *Syntaxis*, we may say that, although the arguments are logical enough in their form, they presuppose either a part of the Ptolemaic view of the universe or notions contradictory to the Ptolemaic view. It is no wonder that, in chapter eight, he assures us that "these hypotheses . . . have been outlined here in such a summary way since they will finally be established and con-

[13] *Ibid.*, p. 19, lines 20-22 (I, 5).
[14] *Ibid.*, p. 19, line 22–p. 20, line 2 (I, 5).
[15] *Op. cit.*, II, p. 532, line 12–p. 534, line 6 (XIII, 2).

firmed by the agreement of the consequent proofs with the appearances." [16]

It seems worthwhile to pause here and to consider parenthetically the character of the proof offered by Ptolemy. Verification by falsification, in the manner described above, would, of course, be a highly desirable method of obtaining firm and certain truth. But it is most difficult to be assured that we have a complete disjunction—that we have all the possible hypotheses before us. We may well, as is the case with Ptolemy, have some hidden presupposition that will invalidate our disjunction. We may fail to see other possibilities which really exist. Then too, there is the problem of actually falsifying all but one of the hypotheses. We have just seen Ptolemy fail to do this.

III. Arguments Showing That the Earth is Immobile.

We may now pass to chapter seven, where Ptolemy attempts to make the immobility of the earth a plausible hypothesis. First, he simply concludes from chapter five:

> By the same arguments as the preceding it can be shown that the earth can neither move in any one of the aforesaid oblique directions, nor ever change at all from its place at the centre. For the same things would result as if it had another position than at the centre.[17]

There are two difficulties with this argument: first, it rests on arguments, the difficulty of which we have just been examining; second, its conclusion rests on an inference from the present and past state of the earth to its future state. This inference presupposes that we can acquire knowledge about the nature of things. But this knowledge can scarcely be derived from the non-movement of the earth up to now. We must observe some motion which will lead us into some kind of knowledge of the nature. *Ignorato motu, ignoratur natura.* Ptolemy himself tells us:

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[16] *Op. cit.*, I, p. 26, lines 6-12 (I, 8). [17] *Ibid.*, p. 21, lines 9-14 (I, 7).

For the general property of the material essence is pretty well evident from the peculiar fashion of its local motion—for example, the corruptible and incorruptible from straight and circular movements, and the heavy and light or passive and active from movement to the center and movement from the center.[18]

Where then can we find such evidence about the natural properties of the earth? Ptolemy proceeds to develop this point immediately:

And so it also seems to me superfluous to look for the causes of the motion to the centre when it is once for all clear from the very appearances that the earth is in the middle of the world and all weights move towards it. And the easiest and only way to understand this is to see that, once the earth has been proved spherical considered as a whole and in the middle of the universe as we have said, then the tendencies and movements of heavy bodies (I mean their proper movements) are everywhere and always at right angles to the tangent plane drawn through the falling body's point of contact with the earth's surface. For because of this it is clear that, if they were not stopped by the earth's surface, they too would go all the way to the centre itself, since the straight line drawn to the centre of a sphere is always perpendicular to the plane tangent to the sphere's surface at the intersection of that line.[19]

It follows necessarily that all earth tends toward the center of the universe (and consequently that the earth itself, being at the center, is immobile), if only we can presuppose that the earth is spherical, which was discussed in Book One, chapter four of the *Syntaxis,* and that the earth is in the center of the universe, which was discussed in Book One, chapter five. This argument may recall to mind a similar passage in the *De Caelo.*[20] We have here the Aristotelian doctrine of natural place, which we find used again a little farther on in this chapter:

And of the compound bodies in the universe, to the extent of their

[18] *Ibid.*, p. 7, lines 11-17 (I, 1).
[19] *Ibid.*, p. 21, line 14–p. 22, line 11 (I, 7).
[20] *De Caelo*, B, 14, 296b 18-21.

proper and natural motion, the light and subtle ones are scattered in flames to the outside and to the circumference, and they seem to rush in the upward direction relative to each one because we too call "up" from above our heads to the enveloping surface of the universe; but the heavy and coarse bodies move to the middle and centre and they seem to fall downwards because again we all call "down" the direction from our feet to the earth's centre. And they properly subside about the middle under the everywhere-equal and like resistance and impact against each other.[21]

And if it had some one common movement, the same as that of the other weights, it would clearly leave them all behind because of its much greater magnitude. And the animals and other weights would be left hanging in the air, and the earth would very quickly fall out of the heavens.[22]

But clearly Ptolemy is very much overstating his case when he says, in the argument cited, that "it is once for all clear from the very appearances that the earth is in the middle of the world. . . ." It does not seem possible that he can really mean this in the light of what we have already seen concerning the arguments advanced on behalf of this position. The position of the earth at the center of the universe was accepted only hypothetically in chapter five. And in view of this, it also appears that the Aristotelian version of natural place was accepted only hypothetically by Ptolemy.

To those who might wonder at the immobility of the earth and think it impossible, Ptolemy offers a dialectical argument, quite outside his own system of thought:

All those who think it paradoxical that so great a weight as the earth should not waver or move anywhere seem to me to go astray by making their judgment with an eye to their own affects and not to the property of the whole. For it would not still appear so extraordinary to them, I believe, if they stopped to think that the earth's magnitude compared to the whole body surrounding it is in the ratio of a point to it. For

[21] *Syntaxis*, I, p. 23, lines 3-16 (I, 7).
[22] *Ibid.*, p. 23, line 20–p. 24, line 2 (I, 7).

thus it seems possible for that which is relatively least to be supported and pressed against from all sides equally and at the same angle by that which is absolutely greatest and homogeneous. For there is no "above" and "below" in the universe with respect to the earth, just as none could be conceived of in a sphere.[23]

IV. Refutation of the Hypothesis of a Rotating Earth.

Having sufficiently discussed his own position, Ptolemy now turns to refute those who would postulate a moving earth:

Now some people, although they have nothing to oppose to these arguments, agree on something, as they think, more plausible. And it seems to them there is nothing against their supposing, for instance, the heavens immobile and the earth as turning on the same axis from west to east very nearly one revolution a day; or that they both should move to some extent, but only on the same axis as we said, and conformably to the overtaking of the one by the other.[24]

This hypothesis which Ptolemy now sets out to refute is clearly that of the rotation of the earth, not of its revolution. It is strange that he does not even discuss the hypothesis of revolution although the heliocentric doctrine had been advanced long before his time.

His refutation follows the same general pattern that we noted earlier. The consequences of the hypothesis are deduced and seen to be contrary to the appearances. Although the argumentation is somewhat lengthy, we shall include it for the sake of completeness.

But it has escaped their notice that, indeed, as far as the appearances of the stars are concerned, nothing would perhaps keep things from being in accordance with this simpler conjecture, but that in the light of what happens around us in the air such a notion would seem altogether absurd. For in order for us to grant them what is unnatural in itself, that the lightest and subtlest bodies either do not move at all or no differently from those of contrary nature, while those less light and

[23] *Ibid.*, p. 22, line 12–p. 23, line 3 (I, 7).
[24] *Ibid.*, p. 24, lines 5-13 (I, 7).

less subtle bodies in the air are clearly more rapid than all the terrestrial ones; and to grant that the heaviest and most compact bodies have their proper swift and regular motion, while again these terrestrial bodies are certainly at times not easily moved by anything else—for us to grant these things, they would have to admit that the earth's turning is the swiftest of absolutely all the movements about it because of its making so great a revolution in a short time, so that all those things that were not at rest on the earth would seem to have a movement contrary to it, and never would a cloud be seen to move toward the east nor anything else that flew or was thrown into the air. For the earth would always outstrip them in its eastward motion, so that all other bodies would seem to be left behind and to move towards the west.

For if they should say that the air is also carried around with the earth in the same direction and at the same speed, none the less the bodies contained in it would always seem to be outstripped by the movement of both. Or if they should be carried around as if one with the air, neither the one nor the other would appear as outstripping, or being outstripped by, the other. But these bodies would always remain in the same relative position and there would be no movement or change either in the case of flying bodies or projectiles. And yet we shall clearly see all such things taking place as if their slowness or swiftness did not follow at all from the earth's movement.[25]

The hypothesis of rotation is simpler, as Ptolemy himself admits; but the simplicity of an hypothesis in accounting for the *astronomical* appearances is not the total criterion of its truth. *Other appearances*—not in the heavens but in the air—rule this hypothesis out. The objections of Ptolemy are answered by Copernicus,[26] but only at the price of assigning more than one natural motion to a body. Once again the doctrine of natural place is the foundation of Ptolemy's argument. Before leaving this argument, we should note that, within the context of Aristotelian physics, it is actually more than a refutation of the rotation of the earth. It would apply just as well to any motion of the earth.

[25] *Ibid.*, p. 24, line 14–p. 26, line 3 (I, 7).

[26] Nicholaus Copernicus, *On the Revolutions of the Heavenly Spheres*, I, 8.

V. Conclusion.

Ptolemy uses the Aristotelian physics throughout his argumentation. But he has not, even to his own mind, achieved a demonstration of geocentricism. Nor does he regard it as given. He has advanced some considerations by which he hopes to make it a plausible hypothesis. Without Aristotle's confidence in the absolute validity of our sense perception of the relationship of the heavens to the earth, he nevertheless regards geocentricism as a reasonable hypothesis to interpret the appearances.

The geocentric hypothesis becomes "established and confirmed," as was said in the text cited at the beginning of this article, only because all of the appearances can be accounted for by it. But what does it mean to "establish" an hypothesis? It would seem that, for Ptolemy, this merely means to give it a more or less settled status, much like the status which we give to the law of universal gravitation. This does not mean that geocentricism, or the law of universal gravitation, is true, if we mean by truth the conformity of intellect and thing. It would be far better to use the notion of consistency here. Geocentricism is a theory with which all of the appearances then observed were consistent. In this sense, we might, if we so choose, call geocentricism "true" for Ptolemy. This "truth" is susceptible of "confirmation," whenever we succeed in demonstrating appearances by means of the theory. We can become certain of the theory not as a physical fact but as a consistent interpretation of the appearances, at least of the appearances known to Ptolemy. Indeed, even today, one might get a consistent interpretation of the appearances, however complex, on a geocentric basis; but it is no longer worth the effort.

Loyola University,
Chicago, Illinois

Poetic Tension: A Summary*

by W. K. Wimsatt, Jr.

WITH this disappearance of the idea of *Original Sin,* with the disappearance of the idea of intense moral struggle, the human beings presented to us both in poetry and in prose fiction today, and more patently among the serious writers than in the underworld of letters, tend to become less and less real.

—T. S. Eliot, *After Strange Gods.*[1]

Though evil in itself is non-being, it is indirectly a condition of the interactions of being, since it is a condition of all action. . . . There would be no such thing as action if there were no contraries, for contraries are the basis of all interchanges: the very weakness of certain things, whether beings or phenomena, is sacrificed for the birth or success of others. This is just as true in the moral order as in the material. There would be no life for the lion without death for the sheep, nor martyr's patience without the malice of his persecutors.

—A. D. Sertillanges, O. P., *Foundations of Thomistic Philosophy.*[2]

There is no topic so large that it cannot be at least alluded to in a single sentence or a single word. The aim of this paper is to survey a central problem (I believe it is *the* central problem) of literary criticism today, in fifteen pages. What I am going to try to say divides into four parts: (1) a short history, (2) an exposition of alternatives in literary theory, (3) a suggestion concerning a choice, and (4) a discussion of some difficulties that may be involved in that choice.

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[1] (London, 1934) p. 42.

[2] Trans. G. Anstruther, O. P. (London, 1931) p. 126.

(1) The history deals with where we are today in literary theory and how we got here. And thus I recite:

The eighteenth century was a hard, flat era in metaphysics—an age of rationalism, of "enlightenment"—when the art of poetry enjoyed either a decorative, ornamental function or else a completely unbuttoned sentimental function. Poetry was thought to be properly occupied either in recommending truth by the addition of metaphors, or in promoting a healthy indulgence of the tender and dark range of feelings. Then a great renaissance of poetic prestige occurred with the German romantic philosophers and poets following Herder and Kant. In fact, poetry came to enjoy an unprecedented prestige; it was now creation, vision, philosophy, myth, ironic transcendence, religion.

Poetry occupied a high eminence. Yet that eminence was ambiguous; the stress of poetic theory was dual and doubtful. For on the one hand, it fell on poetic autonomy, the freedom of poetry from scientific and doctrinal norms; and on the other, it fell on the responsibility and power of poetry and hence on its didactic and evolutionary future. Thus two very prominent developments run down through the nineteenth century toward our own day. In one line of development we can group several kinds of didactic theory: the visionary, bardic, rhapsodic, prophetic, as with Shelley and Carlyle; the classical, humanistic, critical, rationally ethical, as with Arnold; the realistic, sociological, and evolutionary, as with French and Russian novelists, like Zola or Tolstoy. And in another line of development, we trace the rich history of the theory of art for art's sake, with various phases in France and England from Victor Cousin (academic and Kantian) to Whistler, Pater, and Wilde—the last especially inheriting and developing in his own paradoxical way a quasi-Hegelian creative view of both art and criticism.

What may be distinguished as yet another, and for criticism

today an even more important, kind of theory, was more closely allied to art for art's sake than to any form of didacticism. This was French "symbolism"—a certain kind of esoteric reassertion of the claims of spirit and imagination against scientism and social realism. "Symbolism" made its way by a subtle concern with "music" of "ideas," with intimations, vagueness, mystery, ineffability. As the Roman poet Horace had done for the neo-classic world, this school of French theorists for the post-romantic world, did much to establish the idea of the poem as an *object of art.*

The twentieth century shows manifold after-traces, numerous subsequent chapters in the history of all those nineteenth-century trends. Thus in America: Arnoldian humanism, merged with New England ethical transcendentalism, reappears in the neo-humanism of Babbitt and P. E. More. Sociological and realistic theory continues in the "muckraking" movement, in the naturalism of Frank Norris, and most emphatically in the Marxist criticism of the 1930's. Art for art's sake survives in the esotric, cosmopolitan, gilded acrobatics of the *Smart Set* and *Mercury* writers during the 1920's. (One should mention here too the theory of "significant form" in visual art, as with the British art critics Bell, Fry, and Wilenski, having remote origins in Plato and immediate origins in the Whistlerian kind of art for art's sake.) Lastly, "symbolism" developed, through the "imagism" of the second decade of the century, into the "ironic-conversational," "neo-classic," and "neo-metaphysical" complex of ideas so brilliantly represented in Ezra Pound and T. S. Eliot.

Meanwhile, at the level of general aesthetics, the idea of aesthetic autonomy was carried to its ultimate by Benedetto Croce, and in the area of literary theory several kinds of reaction set in during the 1920's and 1930's: semantic, psychological, mythopoeic, surrealistic. Thus we can distinguish, for

one thing, the Freudian psychology of unconscious drives and dream mechanism as it affects both literary analysis and literary biography, and for another, the Jungian psychology of archetypal images joined with anthropology in the pursuit of myth and ritual, and for a third, the much more subtle, ironic and tensional affectivism of I. A. Richards. This last was joined with semantics (the analysis of the ambiguous riches of verbal expression) by both Richards and his pupil Empson. This kind of affectivism goes back through nineteenth-century utilitarian ethics and aesthetics (as in J. S. Mill's essays on poetry) to the emotive emphasis of the eighteenth century.

And all this while too, in the academies, the historical method of literary studies was being vigorously developed—with various affinities for the other ideas we have just surveyed. From the late seventeenth century on, literary studies participated in a growing emphasis on the genius of the author and on the ways in which his genius was affected by his environment. Latterly, in both English and American studies, we have heard an increasingly loud discussion concerning the audience, the era, the social class, for which the given poet may be shown, or may be supposed, to have written.

(2) Thus I arrive at the second part of my effort, the exposition of critical alternatives. And here, since I am an invincible Ramist and visualist in these matters, maintaining that as theoreticians we can make no progress unless in the direction of clarity (even though a certain very deep obscurity and mystery be intrinsic to our materials), I resort to the use of a diagram. This, however, is so simple that it does not have to be drawn. It represents two oppositions and their point of intersection, and hence it has five positions or places, representing what I conceive to be five main or even ultimate types of literary theory. Suppose we have number I, the theory or class of theories which may roughly be called "genetic"—that is,

the theories that assert: "Poetry is, or expresses, a genuine experience of the author." Put this at the top of the diagram. And suppose then as number II, the "affective" theories, those that assert: "Poetry is what moves or pleases, or is relevant to the interests of, a certain audience" or "a certain elite audience." And put this at the bottom of the diagram. And suppose then III, what we may call, for want of any really good single word, the "contentual" poetic theory or group of theories. They can also be called the "didactic." They are all the theories that assert that poetry is a statement of some kind of true message—religious, moral, social, historical, scientific. Put these on the left side of the diagram. And then opposite them, on the right, put IV, a group of theories which may call (with perhaps a certain customary inaccuracy regarding Aristotelian hylomorphism) the "formal" theories—or else the "technical" or the "stylistic." These are all the theories that assert that poetry consists in technique, style, texture, structure, or form: that poetry is "beautiful language," or "effective language."

And then, finally, in the center, about equidistant from each of the other four, and for emphasis having a box drawn around the area, put V, a type of theory which may be called for the moment simply the "tensional," and which I describe roughly as a theory asserting that "Poetry is the expression of a relation between subject and object: dramatic, metaphoric, involving complexity of values. Poetry is more than beautiful language, and less than (or at least different from) religious, moral, and social truth."

I have not tried to include here every possible specific theory of poetry or of art—every theory that has a name and a place in the history of theories. Certain readers will be likely enough to note the absence of the theory of art as play (to name a few examples nearly at random), the theory of vivid sensory real-

ization, the theory of empathy, or the contrary theory of aesthetic distance. My opinion is that all other theories than the five I have presented either reduce to one of these five or else are rather easily put aside as not fitting the facts. Numbers I, II, and III, and IV are extreme or pure theories—each I believe asserting some truth about poetry—and all perhaps being points of reference for the more complicated theory, number V—though all four will not be equally conspicuous or equally available in the discussion of every particular poem. Let us observe that numbers I and II form the axis set up both by the intensive historical method in literary studies and by affectivism of both the Freudian and the Richardsian types. On the other hand, numbers II and IV form the axis of pure, classical cognitive study. That is, despite the difference between the didactic and the formal, these two kinds of theory have in common that they look to something conceived as outside both specific author and specific audience—some truth on the one hand, or on the other, some verbal character.

Number I and II are theories which lean more or less heavily toward subjectivism and relativism. In my opinion they are not really theories of poetry, but theories of its origins and results. However, these theories may actually pose difficult problems for cognitive theory, and they may well represent (or distort) dimensions which the cognitive theorist cannot get along without. Jacques Maritain's *Creative Intuition in Art and Poetry* is one recent book that makes a determined and brilliant attempt to integrate theory of type I (the genetic, inspirational and emotive) with some kind of cognitive theory. His effort is "musical" and visionary, achieving the integration by a direct confrontation between subjectivity and the deepest external reality. It is a theory which may apply fairly well to expressionist and symbolist art, a poem by Eliot or Valéry, a picture by Chagall, Roualt, or Braque. It does not seem to apply very clearly to drama or narrative, Homer or Shakespeare.

As for theories of type III, the cognitive but simply contentual, I remark: Nowadays nobody holds seriously and overtly for poetry as a vehicle of historical or scientific truth. (Strabo's view that Homer is valuable because he teaches the geography of the Mediterranean region may be mentioned as a classical instance of such a view). But nowadays many persons do take quite seriously the view that poetry conveys religious, moral, or social truth. During the post-medieval renaissance, moralism or didacticism in poetic theory meant a certain kind of thing; namely, that poetry was to recommend, adorn, or otherwise enforce or assist a doctrine—but that doctrine was determined by other than poetic norms (by philosophy and revelation). The same thing holds for a great deal of modern sociological and realistic theory, especially the Marxist kind. But in romantic and post-romantic theory other than the social, the didactic virtue of poetry is conceived, on the contrary, as autonomous. That is, poetry itself creates moral and religious norms; it takes the place of philosophy and religion (as in the justly celebrated prophecy of Matthew Arnold). Or, all so-called revelation has always been really poetry.

On the other hand, theory of type IV, the stylistic or formal, corresponds to at least one of the sub-classes of what was known during the nineteenth century as art for art's sake. Nowadays there seem to be very few students of poetry who will overtly and completely confess to this theory. We almost all want somehow to be deeper than that. The accusation that somebody else is in fact a mere "formalist" is, however, heard not infrequently. Sometimes that somebody else is a critic of the dramatic and tensional school (a practitioner of theory V in my diagram). Sometimes he is a neo-Aristotelian, one of those who talks most emphatically about the poem as an "object," a whole object, an Aristotelian *synolon*. As the purpose of my paper is more expository than polemic, I am not much interested in

arguing here that the label "formalist" is affixed with more justice to either one of these schools, though I do not try either to disguise even for a moment my inclination toward position number V in my diagram.

What in fact does anybody have against "form," "style," "structure," "beauty?" Nothing—of course. Let me summarize a few things which everyone knows. Certain arts of visual design, abstract and arabesque, and perhaps certain kinds of music, strongly invite being described in a purely formal way. But poetry is an art of words. And words have meanings. And characteristically, in its greatest instances, poetry has dealt with all the most intense, the hottest, human experiences and problems: with love and hate, sex, war, murder, youth and age, sickness and death, skepticism and faith—with religion. There is a certain sense in which religion is the only theme of important poetry. To tell your audience in the classroom or critical journal that despite all this warmth and depth of content, the only thing that matters, the defining character, is something called "form," or "structure," or "beauty of language"—this will be a fairly cold device, a kind of sellout, a maneuver almost cynical. Structure of meaning, texture of meaning (form, style, technique) are of course actually parts of meaning, important factors in constituting the whole meaning. This is bound to be so, except on the supposition that "meaning" includes only something severely abstract and doctrinal or something practical. You cannot structure a supposed given meaning now one way, now another, without affecting the actual total meaning.

But then set against that kind of truth an opposite kind: the truth, namely, that it has always been difficult, wildly paradoxical, self-defeating to try to affirm a complete union or identity of poetic and moral or religious (social or political) values. Such affirmations almost necessarily tend to be either rigorously

moralistic, and hence exclusive of great batches of the world's recognized literature, or else so exceedingly flexible, latitudinarian, and inclusive, as to be quite ambiguous from any definite moral or religious (or political) point of view.

Thus sketching, or even assuming, some of the main reasons against the simple cognitive theories of types III and IV, the didactic and the formal, I arrive at the observation that the tension between these two types of theory does in fact tend to keep either one from ever clearly triumphing. At the same time, number V, the tensional theory also is a very difficult thing to maintain. And thus most cognitive theories do in fact tend to be reducible to one of the extremes, III or IV, the simply didactic or the simply formal.

(3) And in this way I arrive at the third point, the attempt to give some reasons, or perhaps only to develop those already implied, in favor of the more complicated and central kind of cognitive theory, number V on the diagram. This is a theory which says that a unification or resolution of theories III and IV, the contentual and formal, will operate not flat and straight along a line of abstractly purified cognitive theory, but with a kind of parenthetical bulge or reach, both up and down. This unification will conceive something of both a speaker and an audience in a verbal transaction—though not strictly *the* speaker, or author, of the poem, and not strictly *the* historically determinable audience for whom he may have uttered the poem most directly. The theory tries to use a certain kind of claim coming in from the directions of I and II (speaker and audience) to exert a pull upon III and IV (doctrine and form), and thus both to complicate the two claims of message and form and to implicate them with each other—to turn the means and end of the ordinary pragmatic, rhetorical relation in language into the parts and whole of the dramatic and aesthetic relation. Different persons, different interests, different feelings, different

values, different rhetoric, different metaphor. Metaphor, as Father Walter Ong has expressed it, is the "twinned vision." Metaphor is the holding together of differences. The logical impurity of metaphor is a ready slant, a twist, of abstract idea toward the inclinations of speaker or audience or of both.

One way to put the dramatic thesis would be to say: All poetry (even, for instance, a deeply meditative lyric, or a didactic verse essay) has something of that element of tension or struggle which we easily enough think of as necessary to a novel or a stage drama. And through this tension poetry gives a fresh vision of reality, a fullness, completeness, concreteness of experience. It will be an experience that includes pain as well as pleasure, evil and ugliness as well as beauty and good, an experience where tragic and comic can be discriminated but where they yet show a complementary and an easily mixed relationship.

One technical difficulty with the theory will sometimes be that of locating the *dramatis personae,* the speaker and the audience—especially the audience. The speaker may not be so obvious as Browning's inmate of a Spanish Cloister or the melancholy *poeta ignotus,* Il Pensoroso, of Gray's *Elegy,* or the blind bard of *Paradise Lost;* he may be almost fully universalized, like the gentlemanly ethical rationalizer of Pope's *Essay on Man.* Still we more or less readily accept the notion that some speaker, some *persona,* some mask, even though nearly transparent, some special voice, some tone, is there. We may often feel less sure that that tone entails the idea of any special audience. Poems addressed to a coy mistress, to Dr. Arbuthnot, to Death, to the West Wind, may be too special. It would be all too easy to multiply instances of meditative poetry where the reflective, the philosophic, the sensitive and superior speaker is talking, even though somewhat emotively, only to himself—or, what is much the same thing, to anybody at

all or to anybody or everybody who is interested in listening. And that might be thought a *reductio ad absurdum* of the theory. But I think this is not such a reduction. For if and when a poem is an address of the speaker to himself, the poem still by that very fact is different from science and metaphysics, which properly speaking, I believe, are not addressed to anybody at all, but are simply and purely uttered. (On the other hand, practical discourses *are* addressed to somebody, but then they are practical). The most inclusive and incontrovertible formula for the dramatic aspect of the theory will be achieved in the statement that the self-consciousness of the poem, in any event, always unites both speaker and "mock-audience." The two parties to the drama are joined in the consciousness of the actual audience, the good reader. And thus reflection transcends and envelopes emotive response.

The term "thee" in stanza 24 of Gray's *Elegy* ("For thee, who, mindful of th' unhonor'd dead") refers to the same person as the "me" of stanza 1, and this person is any sensitive, melancholy unknown poet, any "youth to fortune and to fame unknown," and hence again, by extension, any person at all who happens to be reading the poem. The addition to the poem of the last nine stanzas, including the epitaph, and the revision of four other stanzas, have on the one hand created a phantom research puzzle for literal detective minds and on the other have produced the critical opinion (to be sure, a minority opinion) that Gray spoiled his poem by a merely personal appendix to an initially marmoreal statement of something universal. But the truth, I believe, is that Gray remarkably fortified his poem by that addition and revision—completing the personal promise of the first stanza, giving depth and resonance to the "universal" by the dramatization of the "I" in its complementary and responding image, the "thou." He thus made his famous Elegy, the only successful serious poem he ever wrote, something

like a special paradigm of the dramatic, reflexive act of saying and knowing which is basic to the whole poetic business.

(4) But a second kind of difficulty for the dramatic and tensional theory—a dissatisfaction and protest—and perhaps a more heavily weighted one—will run about like this: "A theory of inclusiveness or irony makes poetry a matter of wavering commitment, moral insecurity, uncertainty, skepticism; poetry on this view may even turn out to be an expression of theological dualism, a worship of evil, a form of Manichaeism." Such criticisms have actually been formulated very cogently by several American critics, by Yvor Winter, for instance, in his *Primitivism and Decadence,* by John Crowe Ransom in *The New Criticism* (though latterly Mr. Ransom has been expounding a scheme of Hegelian antitheses which seems to weigh in the other scale), and by Marshall McLuhan in remarks here and there about the Manichaeism of T. S. Eliot.

The question which the technical Christian moralist or the poetic theorist with a moral concern seems most likely to keep asking will run about as follows: Just how is it possible for the poet to give ample and fair play, not only to faith and control, but to the contagious opposites which prove and intensify those virtues—how possible, that is, without either adulterating a pure philosophy about these matters or creating at least moments of imagery which are a yielding and a seduction? The Knight of Temperance in the Second Book of Spenser's *Faerie Queene* breaks up the bower of the enchantress Acrasia, but the feat requires his first getting safely past a few stanzas of very superior pin-up-girl art. The requirement, moreover, is hardly accidental to the poetic needs of the passage. If these stanzas were not at least potentially seductive, it may well be questioned if they would constitute the necessary poetic features at that place in the plot. This example is conveniently allegorized for us by the poet himself into something like a type

of what we are talking about. Much more natural and exciting examples might easily be multiplied. It may be asserted, with as nearly categorical certitude as anything about literature can be asserted, that the poet does not write even a moderately good poem about sheer control or about sheer indifference—any more than about sheer sexual experience. Again, Milton does not achieve his *Paradise Lost* by making Satan a weak or unimpressive figure. It is a well-known scandal that critics have all along tended to read Milton as himself "of the Devil's party." The theologian may not find it directly edifying that Hell in the poem is a more convincing place (a more interesting kind of poetry) than Heaven. Examples, either backward in time to Dante's *Commedia* or forward to Tennyson's *In Memoriam*, to the difference between Newman as a poet and Hopkins, or to Eliot's *Waste Land,* are too easily multiplied to make the experiment interesting. A serious poet seems always likely to be engaged either in some division or mixture of sympathy or in expressing some kind of doubt or hesitation or inquiry about the actual prevalence of some value in a given part of the natural world. And when this doubt reaches total, or cosmic, and hence religious, proportions, it may readily enough slide into some doubt or hesitation about the actual rightness of the supposed value.

But again (and here an apparently slight difference may be the turning point in a large argument), the poetic conflict is one which may well be deeply fraught with theoretical ambiguity, doctrinal inscrutability. Eliot's *Waste Land* may have been during the 1920's, to persons of catechism purity of thought and habit, a somewhat shocking poem. On the other hand, to persons of already sceptical, agnostic, or troubled temper, we may well suppose the same poem to have been a source of something like a dim religious light. Milton's portrait of Satan has that kind of dramatic solidity which makes its

interpretation depend in part on the temper of the interpreter. It is true that the poet always has a perspective, and this perspective (correct or incorrect) is not a mere accident or addition to the dramatic conflict, but an intrinsic part, a condition, of any conflict at all. The confrontation of human motives is not like the mere contrary pull of bundles of hay to the donkey. Yet the perspective as such is not a doctrine, not a didactic stance,-and on the other hand the perspective as such, or alone, is not what makes the poetic virtue. The perspective may even be wrong from the moralist's point of view, and the idea of poetic tension explains how it is possible nevertheless for the poem to have its own validity.

Most likely we attempt to excuse the poem of full philosophic commitment by an appeal to dramatic realization (which is a kind of image). At the same time, most likely too we attempt to excuse the poem of full responsibility for vivid realization by an appeal to some more theoretical kind of knowledge. But this paradox is, I believe, no more than that.

The defender of poetry will say on the one hand that the poet does not in fact conduct his tensional discourse as a rival pair of peep shows, one of the flesh and one of Heavenly (or Utopian) light and grace. Nor does he conduct it as a school dispute, nor yet as any kind of philosophical melodrama, truth and falsity disguised as personages and fighting out their duel to one only canonical conclusion, the triumph of truth. The theater of poetic conflict is human substance itself, ethical substance as Hegel put it. Not that the poet can deliberately or professedly move toward conflict itself as a goal. This is as much a self-defeat as any other direct move on a poetic goal. But the man speaking in the poem will move toward whatever his goal is, honestly, with a sense of the obstructions and drags, the limitations, in a word, the wholeness of the experience. Poetry is not a direct mimesis of any pure kind of human value, either

positive or negative. Rather, the literal drama of the mixed human experience is a kind of intensity and depth which is the opportunity for the poetic reality, the poetic objectification. The poetic dramatization is a special kind of vision, closely related to, and usually involving, the fullness and depth of the analogical or metaphoric vision—as Milton's or Dante's Hell and Heaven are elaborate reverse images of each other, as Joyce's Dublin is a dilapidated speculum of the Western tradition.

Neither the poem nor the poet himself (of course) need be in the position of saying that the virtues themselves, such as chastity, charity, courage, justice, or pure faith and perfect love of God (or whatever the given poet conceives as virtues) are not real goods, to be sought in real life as intensely as may be. Among the modern critics who, moving from poetry to life, talk about "earning" a genuine faith or view of life by knowing the opposites, there are none I suspect who really believe or would suggest that chastity is a virtue which is worthless without the experience of adultery, or charity and justice, without an experience in murder or in robbery. About faith and scepticism, as about Marxist and post-Marxist "liberalism," the dialectic of our times may well leave us more in doubt. But to present the argument of the critic in its necessary and I believe correctly guarded form: He will say that the human condition is intrinsically a material and mixed condition, where faith and love of God and fellow man can scarcely occur except in a milieu and medium that is full of the possibility of their opposites. And this possibility, however it is minimized and pushed to one side by the discipline of the saint, the austerity of the cell, the devotion of the ritual (or discipline of the party), is still a tensional element that is part of the moral quality of the experience. Scholastic philosophy recognizes this fact clearly enough in its account of all the virtues and

especially in its account of faith as an act of the intellect, but directed by the will. Let us utter here the platitude that there is no moral quality in an assent to the Pythagorean theorem, or in either a doubt or a belief that Mars is habitable.

Let me conclude with a broader kind of observation but one which I believe has at the same time, compared to the mere poetics which I have been expounding, a special relevance to the exact place in history where we find ourselves. I think one might summarize the best poetic debates of the past twenty years in America with the observation that the theory of poetic tension is likely to be involved in difficulties with two main kinds of simplification: on the one hand, with the simplifications of hedonistic and utilitarian science and sociology, and on the other with the simplifications of theological and moral doctrine. For the fact is that no matter how correct a doctrine may be it is still an abstraction and a simplification. At the same time, the Christian doctrines have a backing of depth and substantial mystery—whereas the naturalistic are in the end phenomenological, sensate, and flat. So the Christian religious mind would seem likely, in the end, to be more hospitable to the tensional (and metaphysical) view of poetry than the naturalistic mind is able to be. And this is borne out in recent history. The "new" metaphysical criticism (working by the norms of wit, irony, metaphor, drama, tension) has had some of its strongest champions among Christian poets and critics of the Anglican school and has enjoyed for the most part at least a friendly reception in Roman Catholic schools and journals. The same school of criticism has met with strong disapproval from Marxist and other socially oriented thought and in general from the naturalistic Saturday and Sunday popular press.

Yale University
New Haven, Conn.

From the Secretary's Desk

The Thirty-Second Annual Meeting

THE THIRTY-SECOND Annual Meeting of the American Catholic Philosophical Association will he held at the Sheraton-Cadillac Hotel in Detroit, Michigan, Easter Tuesday and Wednesday, April 8 and 9, 1958, under the patronage of His Eminence, Cardinal Mooney and the Catholic universities, senior colleges and major seminaries of the Detroit-Windsor area. Rev. Dr. Allan B. Wolter, O. F. M., has suggested that the general title would be more exactly expressed as "The Role of the Christian Philosopher." Each of the two morning sessions will have two papers on phases of this subject. The same will be true of some of the sectional meetings to be held concurrently in the afternoons in the fields of Logic and Method, Philosophy of Nature, Metaphysics, Moral and Political Philosophy, History of Philosophy and Philosophical Problems. Hotel reservation cards will be included with the distribution of programs which will be made at least six weeks prior to the time of our Annual Meeting. The general sessions of the convention will be held in the Grand Ballroom. The afternoon sesions will be in the Grand Ballroom, Founders' Room and Crystal Ballroom with three meetings being held concurrently on each afternoon.

The following are the summaries of the papers which the Secretary has received up to the time of going to press of this issue of The New Scholasticism:

April 8, 1958: First Morning, General Session—Grand Ballroom—9:45 A. M.

(Registration desk near Grand Ballroom, open, 8:00 to 9:45 A. M.)

President Wolter, Presiding

Place and Function of the Catholic Philosopher in the World Today

by Rev. Pacific L. Hug, O. F. M., Quincy College, Quincy, Illinois

It is necessary today for the Catholic philosopher to look into the grounds of his existence as a philosopher. That he regain, or refresh

in himself, a new sense of his vocation, strictly as philosopher. What disturbing observations seem to compel such reconsideration? In explanation we present: I. A Fact; II. A Problem; III. A Tentative Line of Solution.

I. *The Fact.* It is the all but complete lack of genuine communication between Catholic philosophers and the philosophers whose thinking strongly determines the tone and temper of our contemporary culture—a fact which, though plain to sense and see in the large, still needs some spelling out in detail.

II. *The Problem.* It may be—as Adler has said—that philosophers seldom, if ever, have entered into genuine debate. It may be, for whatever reasons, morally impossible for them to achieve the communication of genuine debate; it is just possible that it might not be as important a matter as some of us would like to think. But the problem of the Catholic philosopher as such remains. What is his function and service? Is it all to be neatly packaged in the formula "*philosophia ancilla theologiae*?" Is the *ancilla*-formula anything more than a partial, hence inadequate, statement of the case for Christian philosophy? Does it even profess to define the central and essential function of Catholic philosophy? Have we as Catholic philosophers become more vulnerable than we know to the charge that we cultivate *only* a "seminary philosophy?" Is it self-evident that we are truly today the living heirs of that great tradition of critical thought represented by the names of Albertus Magnus, Bonaventure, Thomas, Roger Bacon, Duns Scotus, Suarez et al.?

III. *A Tentative Line of Solution.* Perhaps if we see the problem, we shall want to study more profoundly what the great Catholic philosophers of past ages actually undertook as their intellectual responsibility, and achieved—differently in different ages. It is just barely possible that we have not deeply understood nor fulfilled the injunction of Leo XIII to philosophize in the spirit of St. Thomas—that we have therefore failed our contemporaries. Perhaps if we come to understand more thoroughly just what function Catholic philosophy served in its great representatives, we may begin to understand what has happened, and is happening, on the contemporary scene. Understanding this, we may come to share more deeply and responsibly the concern of sincere, contemporary thinkers.

Commentator for Opening of Floor Discussion: Rev. Geron Fournelle, O. F. M., of Quincy College, Quincy, Illinois

The Need for a Christian Reappraisal of the History of Philosophy

by Dr. Balduin V. Schwarz, Fordham University, New York City

The historical development of philosophy, since the beginning of modern times, presents a grave problem to the Christian philosopher. Philosophical productivity became almost the exclusive prerogative of thinkers who had little or no awareness of the true relationship between Christianity and philosophy; and under their influence the achievements of classical metaphysics—and with them, the presuppositions for the Christian Creed—were, with frightening consistency, abandoned, one after another. Since neither accident nor bad will can be held to account for such an historical development, the assumption seems to impose itself that some historical law must govern the course of ideas. Hegel took such a position and, with his dialectics, presented such a law.

Hegel's philosophy, though stripped of its particulars, still dominates the basic interpretation of the history of ideas. This interpretation not only has the consequence of a relativistic paralysis in general; it also explicitly classifies the Christian thinker as one who lives in the dead past, basically cut off from the genuine life of the spirit.

Wherever a man's thinking is considered to be determined by some immanent law in the history of ideas, man is, in the last analysis, deprived of his freedom and responsibility in the domain of wisdom; and relativistic paralysis is the disastrous consequence.

The relegating of Christian thought to a dead past offers a challenge which Christians cannot afford either to ignore or to decline. They cannot afford to ignore it by behaving as if everything that Christians could ever have to say had already been said. They cannot afford to decline it by taking refuge in mere protestations of "progressiveness," —protestations which, all too often, appear to involve a silent surrender to the deterministic thesis.

What, then, is needed for a genuine meeting of the challenge? First, recognition of the problem involved in the fact that Truth is, at once, both timeless and in time. And second, an approach to this problem which is philosophically more sound than that of Hegel.

For such an approach, St. Augustine offers us a starting-point. In his comparison of history with the life of a man, one will be able to discover categories more capable of doing justice to the history of

thought than any mere dialectics, Hegelian or otherwise. To apply his viewpoints to the empirically given history of philosophy is one of the most urgent tasks for Christian thinkers.

Commentator for Opening of Floor Discussion: Rev. Owen Bennett, O. F. M., St. Anthony-on-Hudson, Rensselaer, New York.

FIRST AFTERNOON—SECTIONAL ROUND TABLE DISCUSSION—2:30 P. M.

Division A: Logic and Method Section: Crystal Ballroom:

Dr. Anthony Nemetz, Ohio State University, Columbus, Ohio, Chairman

Problem (a) *Conventional Logic and Modern Logic—Revisited*

by Rev. Joseph T. Clark, S. J., Canisius College, Buffalo, N. Y.

The purposes of this paper are (1) to assemble the four main ***metaphysical*** criticisms appearing in reviews of *Conventional Logic and Modern Logic* (Washington: *ACPA*, 1952), and (2) to reconsider their import. The criticisms are: (1) in the propositional calculus '*p*' and '*q*' do *not* stand for any statements whatever, but can represent *only* logical judgments; (2) it is not true, as the calculus of propositions assumes, that the negation of every statement has a unique meaning; (3) the calculus of propositions cannot deal with the truth or falsity of statements apart from intentionality, and (4) the calculus cannot be independent of metaphysics because reasoning is unintelligible without cause. In reconsidering these criticisms the paper will try to distinguish clearly and effectively between first (a) the *intramental* experience of concept, judgment, reasoning, and (b) the *extramental* expression of the same in term, statement, inference; secondly, in the realm of terms, statements, and inferences between (a) a theory of *meaning*, (b) a theory of *reference*, and (c) a theory of *validity*, and thirdly between the sciences of epistemology, psychology, metaphysics, and logic. In the light of these distinctions a respectful rejoinder will be made to the above four criticisms.

Problem (b): *Ontology and the Intentionality of Logic*

by Dr. Henry B. Veatch, Indiana University, Bloomington, Ind.

Fashions seem to be changing in logic: the much-vaunted ideal languages of the symbolic logicians appear now to be going out of

style; and instead, the new rage is all for those recent styles imported from England, according to which logicians are supposed to occupy themselves almost exclusively with the concrete uses of expressions and turns of phrase in ordinary language. Little wonder that these newer logicians are now quietly putting away in mothballs all those elaborately artificial and formal languages inherited from the days of symbolic logic.

Now it will be our contention that these changing fashions in logic are significant (1) for the light which they shed on the conscious or unconscious ontological orientation of different types of logic, and (2) for their tendency to confirm the thesis that a right understanding of intentionality is of decisive importance for a proper determination of the respective spheres of logic and ontology.

In support of these contentions, particular consideration will be given to the way in which Russell's *P M* logic was oriented to the metaphysics of logical atomism, as well as to the way in which, in the early theories of intentionality of Russell and Wittgenstein, the logical structure of the proposition was supposed to "picture" the structure of the corresponding fact. Indeed, it is in their reaction against this crude sort of intentionality that the more recent English logicians would appear to have gone to the other extreme of supposing that logical devices and relationships have no intentional appropriateness to facts whatever. In consequence, there would seem to be in much of recent logical writing an unfortunate blurring of language and fact, of logic and ontology.

Division B: Philosophy of Nature Section: Grand Ballroom:

Rev. John T. Bonee, O. P., Dominican House of Studies, River Forest, Illinois, Chairman

Problem (a): *Albertus Magnus and the Oxford Platonists*

by Rev. J. Athanasius Weisheipl, O. P., Dominican House of Studies, River Forest, Illinois

At the very beginning of his paraphrase of the *Metaphysics* Albertus Magnus directed his attack on the *error Platonis* "who said that natural things are founded on mathematical, and mathematical being is founded on divine, just as the third cause is based on the second, and the second on the first; and so he said that the principles of natural being are mathematical, which is completely false." (*In Lib. I Metaph.*, tr. I, cap. 1) Albert said he had already rejected this error in his work on the

Physics. Actually in his paraphrase of the ***Physics*** Albert rejected the Platonic position only in passing, discussing it infrequently and very briefly. But in the ***Metaphysics*** it is a central theme running throughout the whole of his paraphrase. Albert had in mind not so much the historical Plato, but the *amici Platonis* (*ibid.*, cap. 8), who were undoubtedly his contemporaries.

In the presentation of the paper the views of these Platonists (the best known of whom are associated with Oxford) will be discussed in some detail to clarify (i) the object of Albert's attack, and (ii) his own view of natural science. It will be shown that in his more mature works Albertus Magnus was particularly concerned with defending the autonomy of natural science against the "Platonic" reduction of natural science to mathematics, and the basing of mathematical number on metaphysical unity and plurality.

Problem (b): *Toward an Integrated Psychology*

by Rev. Melvin A. Glutz, C. P., St. Gabriel Monastery, Des Moines, Iowa

The proliferation of schools of psychology has yielded in the contemporary scene to an attempt at integration of the knowledge that has been accumulated during the last hundred years. Such an integration must take cognizance of the body of valid philosophical data about man. Merely to state this is to raise the question of the relation between natural philosophy and experimental science. However, some of the difficulties and confusions of the over-all problem can be profitably attacked in a particular instance, such as psychology. After briefy setting the backdrop by discussing the nature of science, we shall establish that empirical psychology needs philosophical psychology, and on the other hand, that philosophical psychology needs empirical psychology. Since there is an intrinsic dependence of the two psychologies, one on the other, they must be integrated. A plan for such an integration and the theoretical justification of it will be proposed.

Division C: Moral and Political Philosophy Section. Founders' Room

Rev. John P. Kleinz, Pontifical College Josephinum, Worthington, Ohio, Chairman

Problem (a): *The Deadlock Among Non-Scholastic Authors Concerning Definition of the Ethical Good—A Synopsis*

by Rev. Thomas J. Higgins, S. J., Loyola College, Baltimore, Md.

Until recently non-scholastic authors have considered the fundamental problem of ethics to be the definition of the good and its relation to the right. The empiricists held that the good is a "natural property" of things just as viscosity is a characteristic of petroleum. The deadlock over this definition began in 1903 when G. E. Moore accused the empiricists of the naturalistic fallacy. He said the fallacy consisted in identifying goodness with any empirically observable property. For if the empiricist identifies goodness with, say, pleasantness, he can always be asked, "Is this pleasure good?" If he gives a meaning to goodness in this question, then the identification of goodness and pleasantness breaks down. Moore and the intuitionists said that goodness is a "non-natural" property which can be grasped only by intuition. We know moral goodness in just the same way that the eye knows yellow and can distinguish it from red. The emotivists in turn accused the intuitionists of the cognitive fallacy. For the emotivists say that normative words or judgments express emotion and not truth. The judgment that a thing is good is not a statement about the nature of that object but the expression of our attitude of approval concerning it. In consequence of the interminable debate among empiricists, by the middle of the century, intuitionists, and emotivists, began to bypass the controversy as hopeless of solution. Some turned to meta-ethics, or specialized talk about ethics; others to rhetoric, as though ethics were a kind of persuasive art; others still to logic, or the correct method of reasoning about ethical problems. Such reaction, however, is a turning from ethics to something else; the problem of the good cannot be abandoned. We face the problem by saying, first, that all three contestants are wrong. The empiricists are wrong in their epistemology and in treating ethics as though it were merely a physical science. The intuitionists are wrong in saying we can intuit basic moral good. The emotivists are wrong in saying that truth does not exist in moral judgments. Second, the positive solution is to be found in metaphysics which the non-scholastics will not consider. There is a transcendental good which is being as desirable and suitable. To find the ethical good we apply the desirable and suitable to human nature. But then again, natures and essences are what the non-scholastics cannot abide.

Problem (b): *The "State of Nature" Theories of the 17th and 18th Centuries and the Natural Law*

by Dr. Desmond J. FitzGerald, University of San Francisco

The student of political philosophy in our contemporary non-scholastic universities sooner or later comes to hear of natural law. Studying, for example, the history of modern political theory he learns that the 17th and 18th centuries were ages in which the concept of natural law was well accepted, in contrast to a later reaction against it in more recent times. Consequently there is more than a possibility that he forms his own appreciation of the validity and content of natural law in the context of the "state of nature" theories of such classic political thinkers as Hobbes, Locke, and Rousseau in so far as they spoke of a law of nature.

In reflecting on the relationship of the "state of nature" theorists to natural law, some answer will be given to these questions: Is there a common background for the various "state of nature" theories? What were the intentions of the classic philosophers in offering them? Did natural law thinking serve any special function in their theories? How does their understanding of natural law compare with that of St. Thomas Aquinas and his interpretors? How well do these theorists serve as representatives of the natural law tradition?

TUESDAY, APRIL 8: EVENING GENERAL SESSION—GRAND BALLROOM—8:00 P. M.

Vice President, Dr. Lawrence Lynch, Presiding

Citation for Award of Cardinal Spellman-Aquinas Medal to Dr. Yves R. Simon, University of Chicago

by Dr. V. E. Smith, University of Notre Dame

Response by Professor Yves Simon: *Philosophy and Ideology*

Presidential Address: *Causality*

by Rev. Allan Wolter, O. F. M., St. Bonaventure University

APRIL 9: SECOND MORNING, GENERAL SESSION—GRAND BALLROOM—9:00 A. M.

President Wolter, Presiding

Philosophic Difference and Personal Development

by Rev. Bernard Lonergan, S. J., Gregorian University, Rome, Italy

In Europe at the present time, there is a widespread disaffection for St. Thomas and not a little favor for the apparently more timely doctrines of personalists, phenomenologists, and existentialists. In America, while Thomism holds a secure position among Catholic philosophers, it does happen that those who, after a course in scholastic philosophy, have gone on to other specialized fields, at times exhibit a marked hostility to the philosophy in which earlier they had been educated.

It would seem difficult to disassociate this phenomenon with problems of personal, intellectual development. A new higher viewpoint in the natural sciences ordinarily involves no revision of the subject's image and concept of himself, and so scientific advance easily wins universal and permanent acceptance. But a higher viewpoint in philosophy not only logically entails such a revision but also cannot be grasped with a "real apprehension" unless the revision actually becomes effective in the subject's mental attitudes. So the philosophic schools are many, and each suffers its periods of decline and revival.

It was to foster such a "real apprehension" of one's own intelligence and reasonableness and to bring out its intimate connection with the fundamental differences of the philosophies that the present writer labored in his recent work, *Insight*.

Commentator for Opening of Floor Discussion: Rev. Luke Burke, O. F. M., St. Bonaventure University, St. Bonaventure, New York.

The Role of Affectivity in Morality

by Dr. Dietrich von Hildebrand, Fordham University, New York, N. Y.

Whereas reason, intellect and will have been analyzed time and again, the heart has never been given adequate attention in philosophy. Even when it has been analyzed, it has never received a standing which does justice to the real importance and rank of this center of the human

soul. For the most part, the affective sphere has been excluded from the spiritual realm. This misinterpretation of the affective sphere is certainly due to the fact that this sphere also comprises non-spiritual experiences such as bodily feelings, or mere states, such as bad moods. But also included in the sphere are true value responses, such as holy joy, contrition, sorrow, and, above all, love,—responses which possess all the marks of true spirituality: intentionality, meaningfulness, depth, and intelligibility. Another fact which manifests the fundamental importance of the affective sphere is the fact that happiness itself—whatever its source may be—can only be *felt*; it has no meaning—no existence—except as something affectively experienced.

Commentator for Opening of Floor Discussion: Dr. Alice Jourdain, Hunter College, New York, New York.

APRIL 9: SECOND AFTERNOON: GENERAL BUSINESS MEETING—GRAND BALLROOM—12:00 NOON

SECOND AFTERNOON: SECTIONAL ROUND TABLE DISCUSSIONS—2:00 P. M.

Division D: Metaphysics Section: Grand Ballroom:

Dr. William O'Meara, University of Chicago, Chairman

Problem (a): *Metaphysics and Subjectivity*

by Dr. Ralph McInerny, University of Notre Dame

Under this rubric I would like to compare sympathetically the views of Jaspers and St. Thomas. Jaspers' notion of philosophical faith, of *Grenzsituationen*, of Being as something to which we can refer ourselves, not cognitively, but as a totality—all these introduce into his considerations of metaphysics elements which strike the Thomist as characteristic of prudential decision rather than the acquisition of science. The notion of the *Umgreifende* that we are makes explicit the notion that we as subjects are essential to philosophy. Jaspers is clear that he is not enunciating a moral philosophy; yet how can we understand his views that the philosopher must live his philosophy, that philosophy is somehow that which makes us what we ought to be? This introductory portion will be expository of the above mentioned points of Jaspers' thought, the references to traditional doctrine being not judgmental but rather an attempt to elucidate Jaspers in terms of what may be more familiar.

Secondly, a brief statement to the effect that for St. Thomas all theoretical knowledge, practical and *a fortiori* speculative, is independent of the subjectivity of the knower. That is, in the acquisition of metaphysics (which, though wisdom, is a science) the intellect must be moved by the evidence of its object, and not by something extraneous, i. e., the subjectivity of the learner.

Thirdly, and perhaps most importantly, an attempt will be made to show the value of Jaspers for the Thomist. This will be done by recalling certain Thomistic doctrines which seem to have fallen into oblivion. Although extrinsic to properly scientific assent, appetite, subjectivity, may be essential to the learning of metaphysics. The significance of the maxim: *oportet addiscentem credere.* Philosophy is science, not faith, but there is a faith proper to the aspiring philosopher. Also, there is the passion (movement of appetite) generated by wonder which is the beginning of philosophy. The moral virtues proper to the intellectual: appetitive prerequisites to the acquisition of science. To say that these factors are extrinsic to the science of metaphysics, is not to say that they are unimportant. The judgment by connaturality, in which the subjectivity and appetitive state of the subject, influences intellect not as efficient cause but in the line of objective causality—is it this that Jaspers would have constitute philosophy? Seemingly. One must agree with Jaspers that with regard to God (who is, so to speak, a metaphysical entity) it is always true that appetite gets to Him more surely and quickly than does traditional metaphysics.

Comment led by Rev. Dr. R. W. Mulligan, S. J., Loyola University, Chicago, Ill.

Problem (b): *The Nature of the Possible According to St. Thomas Aquinas*

by Rev. Edmund W. Morton, S. J., Gonzaga University, Spokane, Wash.

This paper defends the proposition that the possible is derived from being and not *e converso.* The paper opposes the doctrine that being is a derivative of two prior notions; namely, the real and the possible. The nature of the possible is explained from the text of St. Thomas, using as a key text, *De Potentia,* q. 7, a. 11. The possible is an *ens rationis.* There are two kinds of *ens rationis* according to St. Thomas; namely, negations and relations. The possible is a relation of reason insofar as it is the result of a mental ordering of several causes to each

other which are orderable (*ordinabile*), but *de facto* not actually so ordered.

Division E: History of Philosophy Section: Crystal Ballroom:

Rev. Linus J. Thro, S. J., St. Louis University, Chairman

Problem (a): ***Univocity and Analogy of Being in the Philosophy of Duns Scotus***

by Rev. S. Y. Watson, S. J., Jesuit House of Studies, Mobile, Alabama

This paper will briefly consider Scotus' general teaching on univocal, equivocal, and analogous predication, and then, in as much detail as time allows, his application of this to the predication of being. In particular it will discuss the various reasons which led Scotus to his doctrine of the logical univocity of being, and will show how in his system this is not opposed to real analogy. Finally, an effort will be made to appraise the significance of this doctrine for contemporary scholastic thought.

It is worthy of note that a number of present-day Thomists in criticizing Cajetan's interpretation of St. Thomas's teaching on analogy leave room for what we have called the logical univocity of being (as distinguished from its real analogy). If their own interpretation is correct, it would seem that on this important question Scotus does not differ from St. Thomas as much as is commonly supposed.

Problem (b): ***The Meaning of 'Complicatio-Explicatio' in the Philosophy of Nicholas of Cusa***

by Dr. Thomas P. McTighe, Georgetown University, Washington, D. C.

Nicholas' theory of the real reflects the influence of diversely developed Platonisms. His preference for the metaphysics of unity and otherness will be studied in his use of the categorial couple "Complicatio-Explicatio." Under this rubric he expresses the relationship of God and creatures or the One and the Many. Oneness is the quiddity of each thing. In their oneness things are enveloped in the absolute indistinction of the One. God is the *Complicatio* of all things in that things have the status of "inseity" in the transcendent unity which is God. *Explicatio* designates the One as developed into plural contracted ones.

An intriguing problem remains: what account can be given of the multipliability of the One? Or does Cusa leave us with the surd of sheer multiplicity?

Division F: Philosophical Problems Section: Founders' Room:

Brother Pascal, O. S. F., St. Francis College, Brooklyn, New York, Chairman

Problem (a): *The Church and Scholasticism*

by Rev. Robert F. Harvanek, S. J., Oak Park, Illinois

The relations of the Church and philosophy is one of the continuing problems of a Catholic philosopher. The question in our own day has been raised to a special prominence by the Church's sponsorship of the philosophy of St. Thomas. There has as a consequence been much discussion of the Church and Thomism, the meaning of "the philosophy of St. Thomas" in the statements of the Church, the nature of the obligation imposed, etc.

One result of this special interest has been that an interesting larger question has been neglected—namely, the question of the attitude of the Church in modern times towards philosophy in general. The question would be formulated thus: In the varying pronouncements of the Holy See and the Bishops over the last 100 years, is there a pattern discernible which shows how the Church herself habitually views philosophy?

After remarking that, corresponding to the historical swing of positions, where the Church once felt the need of stressing the inadequacy of philosophy as an ultimate science, since the Reformation she has tended on the other hand to speak out in defense of the natural capacities of man, and in recent history especially of his reason, I will suggest that when the Church discusses philosophy, the following four "ideas" form what might be called its external essence: 1) the idea of Christian philosophy; 2) the idea that this Christian philosophy was gradually built up over the ages; 3) the idea that St. Thomas is the chief and outsanding representative of this Christian philosophy; 4) the idea that this Christian philosophy is a *philosophia perennis*, enduring in its main lines from the beginning and discernible in all its principal representatives.

Problem (b): ***The Need of Curriculum Revision in Scholastic Philosophy in America***

by Rev. Hunter Guthrie, S. J., St. Joseph's College, Philadelphia, Pa.

Until the recent past, scholastic philosophy in our colleges had the limited task of training the student's reasoning powers. Content was generally considered a propadeutic to, or reason's agreement with, revealed religion. With the departure of the classics from our classrooms and with the increasing arrogance of anti-Christianity in the market place, we are witnessing the collapse of western culture, and, correlatively, the build-up of a country-wide, cultural vacuum which, in turn, is the best possible propadeutic for Communism.

The traditional, educational conveyor-belt of western culture from generation to generation were the now defunct classics. Today, philosophy is the only medium of cultural transmission left the educator. It could be the best means he ever had in his pedagogic arsenal, but it must be rolled out from the moth-balls and recommissioned. The talk will attempt to outline the current cultural aridity; analyze its causes; show that scholastic philosophy could nullify those causes; show how this could be done in a revised curriculum.

Each reader of a paper at our Annual Meeting should note that a copy of his paper must be filed with the Secretary at the time of the Annual Meeting for publication in the Annual Proceedings.

Regional Meetings

The fall session of the Western New York Conference of the American Catholic Philosophical Association was held on Saturday, October 19, 1957, at Rosary Hill College, Buffalo, New York. The speaker was Rev. Stephen Gerenser, S. P., professor of philosophy at Rosary Hill College, whose subject was "The Comparison of Traditional Western and Oriental Ethical Systems." Rev. William L. Reilly, S. J., of Canisius College is secretary-treasurer of the Conference.

The Maryland-District of Columbia Conference held the first meeting of the academic year at Catholic University of America on November 1, 1957. Dr. Bernard Duval spoke on "Moral Evil and Psychiatry." The second meeting will be on January 10, 1958 at St. Mary's Seminary in Baltimore. Rev. Robert E. McCall, S. S. J., is the chairman of the Conference.

Miscellaneous Items

The secretary has received a communication from the Arne Jensen Travel Inc., concerning the possibility of arranging a charter airflight at greatly reduced prices for Americans who would be attending the 12th International Congress of Philosophy at Venice, Italy in 1958. The company will also take care of all travel and hotel reservations on an individual basis. Anyone interested may communicate with the Office of the Secretary of the Association or directly with the Jensen Travel Bureau at 331 Madison Avenue, New York 17, New York.

The International Congress of Medieval Philosophy will be held at Louvain-Brussels, August 28—September 4, 1958. The general theme of the Congress will be "Man and His Destiny according to the Thinkers of the Middle Ages." The Secretariat is at Centre de Wulf-Mansion, 2 Place Cardinal Mercier, Louvain, Belgium. The Committee on direction are F. Van Steenberghen, G. Verbeke, H. L. Van Breda, and M. Giele. Our membership is cordially invited to attend the various sessions.

The fifty-fourth annual meeting of the Eastern Division of the American Philosophical Association was held at Harvard University, December 27-29, 1957. Symposium papers and abstracts of papers have been published by the *Journal of Philosophy*. Papers appeared in three successive double issues of the *Journal of Philosophy* beginning with the issue of October 24. Nonsubscribers to the *Journal of Philosophy* receive these issues by communicating with the *Journal of Philosophy*, 712 Philosophy Hall, Columbia University, New York 27, New York. The charge is $1.00 which should be remitted with the order. Check should be made payable to the American Philosophical Association, Eastern Division.

The seventh series of the McAuley Lectures from St. Joseph College, West Hartford, Connecticut, for 1957 and 1958 include the following subjects and speakers: "The Development of Mariology in Catholic Theology" by Very Rev. Msgr. George W. Shea, October 22, 1957; "Towards a Biblical Theology of the New Testament: Modern Trends in Catholic Scriptural Scholarship" by Rev. David Michael Stanley, S. J., November 12, 1957; and "Authority and Freedom in Religion—The Catholic Concept" to be given by Most Rev. John J. Wright, D. D., on April 29, 1958.

The American Society for Esthetics held its thirteenth annual meeting in the auditorium of the National Museum, Washington, D. C., on

October 25-27, 1957. Papers were read in various fields of the arts, including music, painting, sculpturing and the literary arts. The meeting closed with a complimentary performance of Melville's *Billy Budd* given by the speech and drama department of the Catholic University of America. Dr. Thomas Monro of the Cleveland Museum of Art is the national secretary. The Association publishes the *Journal of Esthetic and Art Criticism*. Those interested in membership may communicate with Dr. Monro.

The Annual Aquinas Lecture at Marquette University will be held in March. The speaker will be Professor Henry Margenau of Yale University. His topic will be *Saint Thomas and the Physics of 1958: A Confrontation.*

CHARLES A. HART
National Secretary

The Catholic University of America,
Washington, D. C.

Book Reviews

Philosophy of Science. The Link Between Science and Philosophy. **By Philipp Frank. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1957. Pp. xxii + 394, with index. $8.00.**

The reason for the subtitle is that the author thinks that he is beginning the work of reestablishing a link that formerly existed between philosophy and science. The link existed when the mediately general principles of science were philosophy, that is, when science and philosophy were not distinguished from one another. The other end of the chain was directly knowable observations. The happy era when the link existed, according to Frank, was the era of ancient and medieval science.

The main concern of the philosophy of science, for the author, is the relationship between direct observations and the concepts that we use in scientific description. The problem is to decide between different concepts which explain equally well what we observe. Since the experimental scientist does not observe the quantities that occur in the patterns of scientific description, as, for example, when he describes the falling of a cigarette paper in terms of a uniformly accelerated motion downward and a uniform motion horizontally, he needs to understand precisely what the import is of the terms that he does use in his description. He needs to know what the relationship is that ties his scientific explanation to the observations explained.

In order both to show what the problem is and how it was solved in the ancient and medieval era, the author begins with a quotation from Aristotle on the process of knowledge as it proceeds from what is more readily knowable to us to what is more intelligible in itself. The problem is to establish a satisfactory relationship or connection between what is easily knowable to us and what is self-evidently intelligible. The purpose of the intelligible in itself, for the scientist, is to explain in a plausible way the phenomena we observe. We observe facts and we try to set up principles from which we can derive these observable facts. The principles are intelligible because they are analogous to our daily common-sense experience. They are valid or practical because they somehow agree with the facts. They don't in themselves agree with any facts for they aren't testable. But by means of operational definitions

they agree with the facts, and this is one prime reason for their existence. Gravitation and inertia are two of the intelligible principles used by Newtonian mechanics to explain the motion of falling bodies. The chain started with the observations of falling bodies and terminated at its opposite end in the intelligible principles by which the falling could be explained.

The term intelligible means, in this context, derivable from self-evident first principles. In Aristotle's time the perfection of circular motion would be such a principle. The principle was applied to the motions of the heavenly bodies and their orbits were described as circular. Thus the understood perfection of circularity enabled ancient science to deduce the observed motions of the heavenly bodies. As everyone knows this theory of circular motion was replaced by a theory of epicycles which was replaced by a theory of elliptical motion put forth by Kepler. Likewise the geocentric theory gave way to the heliocentric. What these changes wrought, according to Frank, was a rupture of the chain linking science and philosophy. The epicycle theory did explain the observed motions but it was not intelligible; similarly for the Kepler laws and the Copernican revolution.

In general the author sees the break in the chain as first originating when the organismic universe of the Greek and medieval era, with its explanatory principles made intelligible by analogy with organisms, especially man, was replaced around 1600 A. D. by the mechanical world view of Galileo and Newton. Such a world view described appearances quite successfully, but its principles of explanation, especially the one that holds that a body in motion does not need to be moved by another body, seemed to be quite unintelligible. The result of this succession in world views was that the old intelligible principles which worked in the organismic universe now no longer explained appearences as accurately and simply as did the new ones. That is, their link with observable experiences was at best tenuous and for many of these formerly intelligible principles there was no longer any use whatever.

The author stresses one example which is, in fact, a misinterpretation of the argument from the presence of motion to the existence of a prime mover. He cites St. Thomas as proceeding from this intelligible principle of motion, "Whatever is in motion is moved by another," to derive the existence "of a prime mover which was identified, as we learned above, with the ninth heavenly sphere embracing the sphere of the fixed stars" (p. 95). The author in the context implies that all

theology is based upon such questionable intelligible principles and therefore just as we ought to scrap outmoded physical theories, so also we should scrap outmoded philosophical and theological doctrines. If, in Newtonian mechanics, bodies move freely without being moved by other bodies, then the outmoded principle of motion upon which medieval theology rested should be scrapped:

> The modern conception [of Newtonian motion] encountered very great obstacles when it was considered from the point of view of the world system of the Middle Ages. It abandoned the concept of a prime mover, and destroyed the foundations upon which the traditional proofs for the existence of God were based. The world picture needed to be completely rebuilt, not only in physics, but in the fields of theology and ethics as well. For example, the new conception involved the idea that bodies in the sky were not different from those seen on earth. Christ was sent to save the earth, but if this earth were no different from other bodies seen in the sky, why should not God have sent a Savior to the other planets as well? (p. 103)

The reader of this book must simply overlook this and a whole series of similar failures on the author's part to grasp and to state philosophical doctrines correctly. This puerility of treatment of the teachings of Aristotle and St. Thomas does vitiate the first several chapters, but, as is often the case, what the author is driving at is easily grasped apart from his historical examples.

What he is driving at is this. Philosophical principles have no other validity than what they derive from the scientific principles upon which they are based. Since scientific principles, for Frank, are schema that are useful at a particular time and to serve a particular scientific purpose, it is obvious that they are changeable and that they should be changed when they no longer serve their purpose, or when the purpose of the scientist changes. The transition from the use of Euclidian to non-Euclidian geometry in the description of the motion of a mass point in space is used as an example. Whereas Euclidian geometry had been thought to be perfectly intelligible because its basic propositions were thought to be self-evident, non-Euclidian geometry appeared at first to deny intelligibility. But like Newtonian mechanics, it became plausible and intelligible after men thought it over for a while. What the author is pointing to is the change in basic principles of science which precludes any first principles of permanent validity such as the scholastic metaphysics claims to have.

It is in his showing how changeable are the schema of experimental physics that Frank gives a pellucid explanation of the whole development of theoretical science from Newton to the present and also an explanation of the role of mathematics in science. It is this, the major portion of the book, that makes the book really worthwhile. The author's inability to draw philosophical conclusions does not in the least lessen his ability to explain most cogently for the most unskilled layman the true nature of modern physical investigation.

The author does reestablish the link between science and philosophy to the extent that he shows what the link is for those who accept positivist assumptions regarding the nature of thought and language. The abstractness of scientific laws is linked to the concreteness of observable phenomena by means of operational definitions which restate the laws in terms of operations that can be performed so as to give us physical confirmation or disproof of the validity of the laws. Any law for which there is no corresponding operational definition is valueless to science, it is a metaphysical law. But there are some theories of high generality, which explain not only physical phenomena but also are extended into the fields of sociology and religion. For example, Newton's laws of motion were thought to have voided the notion of free will, whereas Heisenberg's concept of the indeterminacy of the Newtonian variables of position and momentum seem to allow for some arbitrariness in human action. Since laws of mediate generality tempt man to formulate these laws of high generality, the religious, political, or social purpose of a law is one of the criteria to be used in selecting among laws that are equally in agreement with experience.

Thus Frank, following the triadic scheme of C. S. Peirce which distinguishes the observed object, the working scientist, and the signs the scientist invents in order to give his presentation, sees in science three components; the semantical component which investigates the relations between physical objects and signs or symbols, the logical component dealing with symbols, and the pragmatic component which studies the relations of the social and psychological circumstances under which the scientist is working his theories.

It is the pragmatic component that the philosophy of science is interested in. The physical value of a theory consists in its being simpler than a mere compilation of observations and in its agreement with observations. Among simple theories it is the dynamic ones, the ones that make science more fit to expand into unknown territory, that

in the past have been thought to be best. Mere agreement with observed facts never singles out one individual theory, that is, there is never only one theory that is in complete agreement with all observed facts. Rather there are always several theories that cover only part of the observed facts. The concept of a true theory as a replica of physical reality is not present in the scientific philosophy of today. Thus non-scientific influences, religions, political, and sociological, do affect the acceptance of scientific theories. Therefore, it is necessary to understand the status of such influences within a logical analysis of science.

There are two main purposes of a theory, the technological purpose and the purpose of directly guiding human conduct. While science can determine the validity of a theory on technological grounds, it cannot successfully determine among various theories of high generality which is the valid one. The validity of such theories cannot be judged unless we ascribe a certain purpose to that theory. This purpose, over and above agreeing with facts, is to support desirable human conduct as the quantum theory, to some interpreters, supports the moral opinions that man has free choice. It is the debate and settling of disagreements about this purpose that is the field of the philosophy of science.

This book is valuable because: it gives an excellent explanation of the main points of modern physical theory; it manifests the impossibility of any valid philosophy on positivist assumptions; and it shows the futility of trying to stretch theories useful in experimental sciences of sub-visible particles to the world of clearly visible facts, that, is, the futility of trying to explain the obvious by the obscure.

FRANK J. COLLINGWOOD

Marquette University,
Milwaukee, Wisconsin.

Psychoanalysis and Psychotherapy. **By Franz Alexander. W. W. Norton & Company, Inc., 1956. Pp. xiv + 299, with index. $4.75.**

This book, written by a world famous psychoanalyst, is a series of rewritten papers and addresses. The table of contents is as follows: (i) Psychoanalysis in Western Culture. An address which is concerned with the origin of psychoanalysis as stemming from the social interest aroused by the industrial revolution. Since technology produces insecurity, and man, under its influence, is shaping his personality into

a machine-like figure, psychoanalysis can function to help a person remain an individual in a complex society. (Would the author want to admit that psychoanalysis should be a daily diet for all citizens?) (ii) Development of the Theory of Psychoanalytic Treatment. From the initial discovery of the unconscious processes and their dynamic influences, passing through free association and transference, the author points out how psychoanalytic theory, in a trial and error process, developed its present methods. It is interesting to see that the author believes that the patient must replace, with the assistance of the psychoanalyst's interpretations, non-conscious functions with *conscious judgment* in order to undo pathogenic experiences. (iii) Some Early Modifications of Technique. This is a discussion of the striving of the unconscious forces of the patient for expression and the integrating tendency of the conscious ego; the person will, with the aid of the psychoanalyst's interpretations, attempt to establish an equilibrium with regard to unharmonious units of synthetic patterns by relearning, so to speak, how to react to objects which were previously non-neutral for the person. (iv) Later Theory and Technique. This is a discussion of transference and counter-transference in relationship to a created situation which, controlled by the psychoanalyst, challenges the patient's ego to develop a new adjustment. (v) Two Forms of Regression and Their Therapeutic Implications. Discusses how and why the transference neurosis develops in all cases that are properly handled. The transference neurosis can be seen as either or both forms of regression: retreat from a new conflict situation to a past gratifying situation, or, returning to again attempt mastery of unresolved tensions. (vi) Technical Problems Concerning the Regressive Evasion of Pathogenic Conflicts. This chapter is concerned with the planned manipulation of the interview by the psychoanalyst. (vii) Some Controversial Issues. The author deals in a brief fashion with matter that is discussed in previous chapters. (viii) Psychoanalysis and Psychotherapy. A discussion of similarity and difference of treatment between these methods. Their difference is the absence of a full-fledged transference neurosis in psychotherapy. The author suggests that a working agreement between the fields is important for future development. (ix) Teaching Psychoanalysis. A discussion of both the growth of psychoanalytic institutes and some of the problems inherent in teaching psychoanalysts and psychiatrists. (x) Opinions of Contemporary Teachers. This presents and comments upon answers to questionnaires sent to leading teachers of psychiatry. The questionnaires were concerned with two

areas: the necessity of every psychiatrist to obtain instruction in the basic concepts of psychoanalysis; and the distinctions between teaching psychoanalytic theory to students in psychiatry and psychoanalysis. The reader will not be able to find a more comprehensive or intimate analysis of the actual situation of the problems and attitudes in the area of teaching psychoanalysis. One has the impression of reading private correspondence between members of a secret society. (xi) Discussion of Prevailing Practices and Views. Exactly what it purports to be, only shorter than one expects. (xii) Summary and Future Outlook. A short, successful attempt to draw all the strings together. There is a bibliography cutting across both the historical and the contemporary scene. There is an index, but it indicates that it's compiler does not recognize the implications this particular area of knowledge may have for the philosopher. We find such concepts as consciousness, personality, and intellectual are used frequently, yet not indexed.

Now that we have such people as Odier, Choisy, Baruk, Nuttin, Caruso, Baudouin and Zilboorg; and now that we have been challenged by Cassirer—the philosopher is not permitted to construct an artificial man; he must describe a real one—Christian philosophers must know both Freud and the modern developments in psychoanalysis. It is no longer philosophical to call Freud a materialist; we now realize he was studying the material dimension of man. It is no longer valid to say that the study of the abnormal will give us no real knowledge of the normal; the modern sciences of man have so redefined man that normal man has become an *ens rationis*. It has come to a point where P. Daniélou, in his articles in *Etudes*, discusses the unfruitfulness of the concept of man as *rational animal*.

If philosophers—especially Thomists—are to build truth upon truth they could find no better place to start than with this book by Alexander. His judgment is balanced; we find an acute awareness of the limitations of psychoanalysis. His explanations are not watered down, yet he writes with an ease and fluency that philosophers should envy (and imitate). Technical terms are—and certainly have to be—used; yet we have no evidence of jargon. Although we would not expect philosophers to sleep with this book under their pillow, the book is certainly a fine analysis of the historical growth and present situation of the psychoanalytic science of man.

ROBERT M. BARRY

College of St. Scholastica,
Duluth, Minn.

The Moral Basis of Burke's Political Thought. **By C. W. Parkin. Cambridge: University Press, 1956. Pp. viii + 145. $2.50.**

Edmund Burke's conception of the moral order and the religious basis of his moral belief have received in Parkin's trim and beautifully printed little volume a unity and depth of consideration competent, along with such recent studies as those of the late Moorehouse F. X. Millar, to lay forever the ghost of shortsighted and superficial interpretation of his thought. "The canonized view of his writings, as a repository of political wisdom and manual of practical statesmanship, has tended to conceal their greater significance as the expression of a coherent moral philosophy of man and community" (p. 2). If most of Burke's utterances sprang into being in the midst of and in response to immediate political contingencies and carry the marks and associations of their origin they yet "converge on a core of moral certainty freed finally from the relative and contingent" (p. 3). And "it is at this level," not at the various others at which it has been Burke's fate to be measured, "that his wholeness and consistency must be assessed" (p. 4). The purpose of the work is to render explicit Burke's moral belief; and the method selected despite difficulties and anticipated objections is to ignore the chronological sequence and contextual reference of Burke's works and treat this published writings and recorded utterances as a single body of thought.

The author is a research fellow of Clare College. The book consists of a preface, an introductory chapter, six other chapters, and a section at the end called "Notes." This contains 6¼ pages of references, almost exclusively numerical, with three columns to a page. A word about these references: the preface has stated the sources and editions of Burke's works, correspondence, and speeches that have been used and given a reference abbreviation for what is there called the "Appendix of References." The vast majority of these are to the sixteen volumes of the Rivington edition of Burke's *Works*. They are given under "Notes" simply by note number, volume number and page number. No titles of the works appear. This means of course that it would be impossible to track down any reference unless that edition were available, which seems to this reviewer an unnecessary and easily remedied limitation.

A carefully documented attempt to bring to focus Burke's interpretation of Contract Theory, in Chapter II, and to wrestle with critical charges of Burke's inconsistency with regard to it, as he opposed the radical interpretation of his day, leads Parkin to the conclusion that

> Burke's treatment of the idea of Contract makes it clear that it retains its religious significance for him, as the acknowledgement of a superhuman law which is the source of human life and the basis of all human relations. . . . Certainly Burke effects a great expansion of the idea of Contract going beyond the earlier assumption of a natural union between individual desire and the acceptance of obligation in the specific contracts to regard human nature as itself a type of contract (pp. 25-26).

There is an interesting development in this chapter of the naturalness of civil society, of the complementariness of natural man" and "civil man," as Burke conceived them, of the limitations of authority, of the right to rebel in response to its unnatural abuse, and of the folly of rebellion when it is an expression of sheer passion and will and against the order of things.

In "The Natural Relation of Society and Government," Chapter III, Burke's further considerations on the structure of society and the nature of government, and on such problems as the relation between property, rank, leadership, and representation are reinterpreted with many quotations at this deeper level. So in the following two chapters, "The Attempt to Realize Abstract Natural Rights" and "Burke's Criticism of the Abstract Idealism of the French Revolution," is his whole attack on the French upheaval. "In Burke's judgment the French Revolution is not only an outburst of passion in the social order, it is a profound disorientation of moral experience and belief" (p. 81).

> The abstract idealism to which it appeals is itself the worse offense against morality, that is against the real moral order. Morality is something to be perceived and acknowledged by human beings, not conceived by them as an image of their better selves. . . . Such ideals are generated by individuals out of conscience and personal feeling, they are subjective and are a revolt against the real moral order in which the individual is held. And this is the objective law of his being, the individual is not at liberty to try to change or improve it; that is simply an attempt to break loose from morality altogether (pp. 95-96).

There is a careful analysis of Burke's uncommon connotation of "expediency" as "fittingness or suitability to conditions in which utility and justice are combined" (p. 98). There is, too, an enlightening re-valuation of Burke's attitude toward theory and speculation as distinct from "abstract reason."

Parkin comes to grips in Chapter VI, "Burke's Conception of the Moral Order," with Burke's notion of a "concrete reason" which he opposes to the abstract. The essence of this is "its recognition of a higher reason, on which it is dependent and of which it can have only

an imperfect awareness. . . . Above all, the higher reason must be sought with humility; His wisdom is not our wisdom; in searching for a 'reason which is not our own,' we can never walk surely except by being sensible of our own blindness" (p. 110). "The higher reason is disclosed in the historical process; history is the record of Nature, the known march of the ordinary Providence of God. . . . The higher reason is not grasped in an abstract vision or a formula, but in a way of life, a communal wisdom" (p. 118). "The assertion of the superiority of traditional moral belief over so called new discoveries in morality is not a romantic preference for times past . . . it is an affirmation of the reality of an unchanging moral order, and of the impiety of innovation and experimentation in morals" (p. 121). Yet respect for traditional moral wisdom "must be inseparable from the awareness of the moral challenge of the present" (p. 128). The "present movement of Providence . . . demands a live response and makes necessary a creative, moral effort. This is the 'practicable virtue' which God has put within our reach; . . . . Burke's conception of the historical process suggests a more exacting and more satisfying human situation, because it implies an encounter with the eternal moral order of each generation in its turn" (p. 130).

"The Religious Basis of Burke's Moral Belief" is the title of the last chapter. In it Parkin sums up his conviction that Burke's morality "rests on a religious perception" (p. 131); that man is for Burke "a religious animal, and religion must be the foundation of civil society" (p. 131). Against the constant background of Burke's attack on the new morality of the French revolutionaries and the Rousseauian doctrine on conscience, Parkin brings out Burke's foundation belief in the dignity of man and the supremacy of God. For Burke "the new system makes life without dignity and death without hope. Those who rebel against God mutilate and degrade his image in man" (p. 136). In opposition to the assumption of an intrinsic discord within the nature of man, Parkin finds Burke's thought to be that, "A religious acknowledgment of the limitations imposed on man by his status as a created being makes possible a true unity within human nature itself" (p. 138). "The individual at one with himself," furthermore, is for Burke, "a microcosm of the small society, the family, and the large society, the community in time, so far as they are responsive to the moving presence of Providence in human life" (p. 138).

The author has made no attempt, beyond one mention in Chapter II

of Burke's "Aristotelian position" (p. 22), on man's perfection, to trace out the sources of Burke's moral beliefs and religious perception. He has simply sought to make clear what they are and that they are the bedrock of all Burke's thinking. His style is an easy flow of carefully organized paraphrase and quotation that bespeaks a mind well steeped, according to the method of his choice, in his subject's voluminous utterances as in "a single body of thought." In the opinion of this reviewer he has vindicated his method and achieved his purpose.

SISTER FRANCIS AUGUSTINE RICHEY, S. C.

College of Saint Elizabeth
Convent Station, New Jersey

God the Unknown. **By Victor White. New York: Harper and Brothers, 1956. Pp. vii + 205. $3.50.**

The Rev. Victor White, O. P., professor of theology at Blackfriars, Oxford, presents in this volume a collection of essays on a variety of topics of current interest in theology and philosophy. There is much that will interest the philosopher particularly in the chapters entitled: The Unknown God, Talk about God, Prelude to the Five Ways, The Platonic Tradition in St. Thomas and The Concept of Justice in St. Thomas.

The reader's interest will no doubt be focussed on the essay: "God the Unknown" from whence the title of the book is taken. In this chapter Fr. White attempts a re-evaluation of the teachings of St. Thomas concerning what is sometimes called man's "learned ignorance" about God. Modern critics of the schoolmen often complain that we are too intellectualistic in our discourses on divine things; as if there are no unknowns for us in this realm of thought. Fr. White presents a refreshing insight into the limitations of human wisdom in knowing God.

There are repeated references to the works of St. Thomas given throughout the essays. This reviewer would appreciate more documentation from these primary sources of Fr. White's belief that the proofs for the existence of God are not proofs. "They are nowadays commonly called 'proofs for the existence of God,' which is rather unfortunate and misleading: they are never so called by St. Thomas" (p. 18). A direct quotation from St. Thomas as to what we are to call them would be highly revealing. Fr. Garrigou-Lagrange in his renowned work: *Reality* writes:

To show the structure and style of the treatise On the One God, as that treatise is found in the *Summa*, as understood by the Thomistic school, our first consideration must be given to the proofs there given for God's existence, since these proofs are starting points in deducing all divine attributes.[1]

Fr. White's commentary on I, 3, 4 ad 2 of the *Summa* needs more elaboration particularly in the hands of the neophyte (p. 18). It is true that man can never comprehend God in what is called a comprehensive concept so that it can be said one knows all about God as God knows himself. Even the blessed in heaven in the beatific vision are not so elevated by the light of glory that they can see God as God sees Himself in the perfection of His Being comprehensively. However, even by natural reason we do possess an objective knowledge of God, Creator and Destiny of Created Nature. The "neti, neti" of the Hindu is indeed a far cry from the way of remotion in our abstract process of knowing God with the most imperfect of intelligences.

Aside from this plea for further elaboration, Fr. White has written an erudite work which certainly merits the attention of American philosophers both scholastic and nonscholastic. The author's mood is always respectful and irenic in treating nonscholastic intellectual trends. Professor and student interested in the world of ideas today will find this book a most broadening experience.

KENNETH F. DOUGHERTY, S. A.

Greyfriars
Oxford, England

Polarity. **By Louis William Norris. Chicago: Henry Regnery Company, 1956. Pp. x + 242, with index. $4.50.**

The author is to be commended for having chosen as the topic of his book the notion of polarity, one of the most important concepts in the field of philosophy. The concept of polarity can be traced to the very beginnings of philosophical enquiry. Even though, today, its implications have often been overlooked, it remains as timely as ever.

Polarity is at the very core of Aristotelian physics, as we can see from the following text:

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[1] R. Garrigou-Lagrange, *Reality*, trans.l P. Cummins (St. Louis, 1950) p. 71.

This brings us to observe that all these thinkers assume as principles some 'couples' of antithetical qualities or forces, and this whether they declare the sum of things to be one and rigid (for even Parmenides erects 'hot' and 'cold,' which he calls 'fire' and 'earth,' into principles); or whether they speak of 'rare' and 'dense'; or whether with Democritus, they speak of 'solidity' and 'vacancy' (the one regarded as the 'existent' and the other as the 'non-existent'), and further distinguish the atoms by position, shape and order, all of which are expressed by *antithetical couples*: position as 'above and below,' 'before and behind,' and shape as 'angular, straight, or curved' (*Physics* 188a20).

At the present time polarity has assumed special significance due to the character of contemporary philosophy, revolutionary and destructive in its tendencies. This last statement is particularly true of Marxism, for the Marxist philosopher cannot conceive change except through the total liquidation of one of the opposites.

Norris divides his book into two sections, the first of which comprises Chapter One, which is a general statement on the nature of a calculus of polarity. The second section covers the other six chapters, each of which develops the calculus of polarity by applying it to a limited problem. Each chapter is again subdivided into three parts, in such a way that the two opposites involved are expounded and illustrated, with reference to various authors. In a third part the author presents his own personal conclusions. This book is very difficult to evaluate. In fact one could be quite unfair by reading excerpts that do not truly convey the author's convictions. The above remark should not be taken to mean that the reviewer agrees wholeheartedly at each step. Norris, though, has a right to be heard, and he presents his case very capably. Since it would be difficult to give a fair criticism of the book as a whole, the following remarks are taken from the first chapter, which is a manifesto of his position.

In the first chapter the author states what we might call the five basic points of his position. He calls them methods. However, they could be more correctly referred to as aspects or parts of a method, since polarity is *one* method in itself.

He certainly succeeds in properly emphasizing some angles which have been more or less overlooked in the past, angles which still fail to command an attention commensurate to their importance. The explanation he gives concerning the *principle of polar autonomy* is very good, and the applications of this principle to the polar relation of unity and plurality are exact and precise. What the author calls the

principle of polar tension, and which he properly opposes to the previous one, counterbalances the opposition between the extremes of the relation, so that each one is not looked upon as an abstraction, but as co-principles. Though he does not mention the fact, the author states in modern terms the traditional scholastic teaching on transcendental relation, as found between matter and form, essence and existence, substance and accident. From these two points, he infers the *principle of axiology*, thus formulating the value of each pole taken in itself. The *principles of polar augmentation* and *polar concretion* however have a limited application. The latter is more closely related to psychological and moral issues. The former acts as a check, in this sense that through this principle the limitations of each pole are made more obvious.

The fundamental aspects of the polarity method exposed by Norris are very interesting and useful. Unfortunately the book is marred by certain sentences scattered here and there, which are unacceptable. On page thirty-one, the author says that "metaphysics is not a demonstrative science, but an art to guide action." Such an assertion is not justified. Again: "The vocation of man is to answer the question: 'who am I?." Such a proposition, if taken at its face value, is conducive to humanism of the most extreme form. Philosophy does not consider man, the absolute. The purpose of philosophy is not fulfilled by the mere knowledge of himself that man can acquire. Philosophy is essentially focussed on God, the ultimate efficient cause and the end of all reality.

Chapter Five could have been omitted. The theological problems raised cannot be treated satisfactorily according to the method used in the other chapters.

The phrase *calculus for polarity* could be somewhat misleading; however, the author explains it in such a way that he avoids any possible misconception. He notes that no question of mathematical precision is involved, and that the quantative aspects brought into play merely shed more light on the metaphysical factors implied in the extremes of the polar relation.

LUCIEN DUFAULT, O. M. I.

Oblate College,
Natick, Mass.

Guides to Straight Thinking. **By Stuart Chase. New York: Harper & Brothers Publishers, 1956. Pp. x + 206, with index. $3.50.**

This work is of the type that is directed to the masses. In the author's opinion, it could enter into the academic world as collateral reading only—a view which is perhaps not quite as modest as one might at first think. Its purpose is to aid the man in the street to improve his thinking and avoid being fooled by the false logic that is beamed into his everyday life by such varied sources as advertising, politicians, propaganda agencies and illogical people. In the first thirty pages the author introduces the reader to logic and its various fields and then gives a small thumbnail sketch of its history. The bulk of the book is devoted to thirteen common logical fallacies, as classified by the author, and consists mainly of examples of fallacious reasoning. The book concludes with chapters on propaganda and others in which the author expresses his views on various and sundry things.

The general tone and scholarly level of the first part can be appraised by a few samples of the "information" it is ready to diffuse among the masses. Aristotle's logic is purely formal and experience has not borne out his hope that the syllogism could be used to demonstrate absolute proof. Medieval scholasticism is a hybrid between Aristotelian logic and theology. The classicists, which term seems to include everybody before the advent of modern science, did not appreciate that the human mind is a blank page on which experience is written and evaluated. Not until the year 1400 were facts able to force their way into Western thought, and of course Galileo and his falling bodies take a bow. The laws of identity, contradiction and the excluded middle are cursorily examined and found to be somewhat wanting. They are not absolutes but have some flexibility. (A correct logical statement of the principle of contradiction could have obviated the author's difficulties with it.) The best way to reason is the way scientists reason. Just how they do is not too clear but their method involves mathematical thinking, semantics, operational definitions, thinking in relationships as Einstein does; after all it is the relation which counts rather than any absolute property, and the use of probabilities instead of absolutes, since the former are not only more accurate but more fruitful in the pursuit of knowledge.

The list of fallacies includes some that are usually found in Aristotelian logic textbooks and a few new ones, at least in name, such as

the thin entering wedge, black and white, and guilt by association. The examples are for the most part extracted from contemporary life and are therefore rather interesting and refreshing. Some might promote more controversy than logical knowledge and indeed a number of them should be thrown out because the author failed to heed his own advice that one should first nail down the facts. His animosity to Senator McCarthy leads him to write: "During the great days of McCarthyism, just to use your mind intelligently could readily identify you with communist type thinking." The author even shows a fallacy the senator would have committed if Senator Flanders had given him the chance. In fact, when treating of matters that somehow involve communism, such as fifth amendment and security cases, the author appears to be more interested in pleading a cause than in exposing logical fallacies. For example, the firing of a security risk is made to look completely illogical. Because a man's mother is a communist it does not follow that he is one. Nor does it follow that he is not a security risk. Arguments that lead to probable conclusions must not be ruled out completely otherwise the practical affairs of life could not be carried out. In this instance the logic of the author would leave the United States extremely vulnerable to communistic espionage, sabotage and infiltration. His treatment of false analogy could easily give the impression that the argument from analogy is practically worthless, at least in national and international problems. The fallacy of self-evident truths appears to be his name for the fallacy of false assumptions. Just what a self-evident truth is, is not at all clear to the reader, and one suspects, to the author. The chapter on the black and white fallacy is a confusing piece of work. Contrariety is confused with the contradictory and several false examples, spawned by the author's ignorance of philosophical knowledge, do not help matters any. The primary source of all the confusion seems to be the author's misunderstanding of the principle of the excluded middle.

The writings of Stuart Chase usually command a wide sale, and this book probably will be no exception. Perhaps it will serve as a stimulus to some followers of the perennial philosophy to enter the field of popular writing in an effort to disseminate truth among the masses. Certainly if the wisdom of the perennial philosophy is to have any influence on our national life and thought, this medium of communication cannot be neglected.

LEO S. SCHUMACHER

Borromeo Seminary,
Wickliffe, Ohio

The Revolution in Philosophy. **By A. J. Ayer, W. C. Kneale, G. A. Paul, D. F. Pears, P. F. Strawson, G. J. Warnock, R. A. Wollheim, with an introduction by Gilbert Ryle. New York: St. Martin's Press Inc., 1956. Pp. i + 126. $2.50.**

This volume presents an excellent, brief history of the rise and development of the philosophical movement known as analysis. It confines itself to *the* revolution in the thought of empirical philosophers. A parallel history could be written on *the* revolution in the thought of metaphysical philosophers. In neither case would there be any need to recognize the other "revolution." Something of philosophical significance could be done with this phenomenon.

Gilbert Ryle points out the major influences which prepared for a new development in twentieth century empirical philosophy: 1) the shift of philosophy from a theological to an independent professional and secular atmosphere; 2) the necessity of justifying the philosophical enterprise by a more accurate and technical method of investigation; 3) the location of the object of philosophy in the meaning of the judgment. The eight lecture-size chapters consider the following: F. H. Bradley; Gottlob Frege and mathematical logic; logical atomism: Russell and Wittgenstein; G. E. Moore: analysis, common usage, and common sense; the Vienna Circle; Wittgenstein; construction and analysis; analysis and imagination.

The unity of the volume consists in showing the line of development from Bradley and Frege to contemporary analysis. Thus Bradley's rejection of the Lockean identification of philosophy with pychology turned philosophy towards a consideration of meaning, especially of the judgment. Frege's symbolism introduced patterns of pure thought, unencumbered by the rhetorical accretion of ordinary language. The logical atomism of Russell and Wittgenstein sought the simple units of meaning, from which all meaning is built up. "This was Hume's line of thought. What Russell did was to present it logically instead of psychologically" (p. 251). Moore reminded philosophers that ordinary language as well as logical constructions had its certainties. Ordinary language, if closely considered, can reveal accurate thought, even though metaphysicians, without justification, let their technical language serve both ordinary and (their) specialized meanings. Compared to mathematics and the sciences and logic, common sense may seem naked and naive, but by rigid analysis it can be understood.

The Vienna Circle, interested in a unified science, showed their

positivism in hostility to metaphysics. They excluded metaphysics by the application of the "verification principle": a proposition is factually meaningful if it can be verified empirically. This left them with the problem of explaining logically formal statements, pure mathematical propositions and value judgments. Wittgenstein followed Moore in defense of common sense and in his interest in ordinary language. But he thought that the data a philosopher needs are not hard to get at. These data are on the surface; to seek for the hidden is a bewitchment of intelligence. To philosophize is to assemble usages, to select and rearrange them in order to get a picture and know one's way about.

Thus these philosophers seemed to have one thing in common, analysis. Taken generally, it is a kind of translation or paraphrase within a language in order to render the less explicit more explicit and less ambiguous. In America analysis has generally taken the form of constructing artificial languages. In England analysis has sought to stay in the framework of common language, whence most philosophical problems arise. The philosopher's task can be divided into two general areas: analytical and imaginative. The analytical has two parts: 1) the therapeutic, correcting distortion of problems caused by the undue pressure of only some features of language; 2) the systematic, research on the language forms, describing and ordering them. The imaginative task is also divided into two parts: 1) exploratory, to ask why our thoughts work in this or that way; 2) inventive, to show how we could think about the same world through the medium of other and different, though related, conceptual forms. Thus contemporary philosophy, the present stage of the "revolution," is not a body of doctrine at all. It is a method. "If any one thing is characteristic of contemporary philosophy, it would be precisely the realization that language has *many* uses, ethical, aesthetic, literary, and indeed metaphysical uses among them" (p. 125, italics his).

The strength and weakness of analytic philosophy is that it presents itself as a method, rather than a body of doctrine. Thus it leaves philosophy open to new insights into the data arising from the common experiences of men, and is not burdened by a preconceived framework which limits the reading of the data. Here all philosophers can learn a lesson, especially neo-Thomists. It is temptingly easy to let one's metaphysics control the understanding of the data; it is more difficult to see that the given data really demand this metaphysical conclusion.

At the same time, in order to be only a method, analytical philosophy

must limit itself to those things it is constructed to handle. Thus it must limit philosophy to talking about meanings. No doubt one can get to reality through meanings. Idealists have always done so, by identifying their meanings with the real. Analytical philosophers are dead set against making this mistake. So set in fact, that even where metaphysical usage is recognized as meaningful, there is no hope of a metaphysics that is "exclusively true" (p. 122). Such philosophy is properly stuck with meanings; and it opens itself to the charge of being a policeman who has no one to police but himself.

FRANCIS C. WADE, S. J.

Marquette University,
Milwaukee, Wisconsin.

The Aim and Structure of Physical Theory. **By Pierre Duhem. Translated by Philip Paul Wiener. Princeton: Princeton University Press, 1954. Pp. xxii + 344, with translator's index. $6.00.**

In the "Translator's Preface" Prof. Wiener, himself an expert in the philosophy of science, writes that

> Theoretical physicists of today, when they are not off on a mathematical holiday from their concern with the observable physical world, still find it necessary to think of many of the problems Duhem discusses and analyzes here. These basic problems include the relation of physical theory to metaphysical explanation; the function of hypotheses, laws, and theories in prediction; the rôle of models and abstractive hypotheses; the relation of observables to unobservables; the relation of mathematical deduction to experimental verification; the nature of measurement and approximate confirmation of theories; the selection of hypotheses; and the relation of common-sense knowledge to scientific knowledge. Duhem offers a more detailed analysis of the rôles of mathematical symbolism and deduction and of experiment in the construction of physical theory than more recent philosophical analysts concerned with problems of logical syntax and semantics that are not as intimately related to the actual language and practice of experimental physics as Duhem's views are. . . .
>
> Without sharing Duhem's Catholicism, the translator submits that Duhem has offered a very strong case for the autonomy of physical science, shown by its internal logic and evolution.

Its internal logic, its method, is that it "explains" something by means of describing something else. Hence, it is always ultimately

descriptive and not explanatory. Duhem has made this point from the perspective of the author (Louis de Broglie, 1953) of the "great" *Traité d'énergétique générale*. Having been made from that point of view it has, naturally, had an impressive effect on nonscholastics. Philipp Frank talks about Duhem's influence on the Vienna Kreis. Nagel continues the discussion of "reduction" (of one science to another). Morris Cohen praises his acceptance of metaphysics. Hempel, Quine, Herbert Feigl, Meyerson, de Broglie regard his proof of the impossibility of a Baconian *experimentum crucis* as classic. A catalog such as this could be made long.

But why has Duhem not been more widely hailed by the scholastics? This translation (issuing incidentally from a nonscholastic center of learning) was received warmly by scholastic reviewers. "Duhem's general attitude is surely the most sensible one." (J. Collins in *Thought*). "The death of Pierre Duhem in 1916 at the age of fifty-five was a loss to Catholic scholarship that has not yet been made good." (Edward Caldin in *The Modern Schoolman*). But earlier, scholastic and nonscholastic alike saw in Duhem some sort of non-realistic philosophy; positivism (Sheen, Maritain), pragmatism (F. C. S. Schiller). Twenty years ago only the rare scholastic would go all out. Msgr. Léon Noël, former president of the Institut Supérieur de Philosophie at Louvain wrote that Duhem ". . . put the critique of science into relation with Thomistic thought. He thus gave a valuable added impetus to the movement of uniting the sciences and traditional philosophy which Leo XIII emphasized in his Encyclical *Aeterni Patris*" (1934). And only the rare scholastic has the physics, mathematics and philosophy to make such views as these more explicitly philosophic against the background of the language of our times.

The reason is not far to seek. Duhem did not handle the labels of philosophy knowledgeably, nor did he know the technical distinctions of scholasticism. And so his language frightened people, or misled them. For example he writes, "Observation does not put us into relation with the reality hidden under the sensible appearances," and that laws, "do not have material reality for their object." In context, however, what these statements mean is that we know material reality through sensations, that these sensations are subjective, and also that we cannot know matter *qua* matter but only *qua* substance.

Another example is the fact that Duhem calls for the independence of physical theory from metaphysics. What he means in context is

that the old "natural philosophies" were unhelpful in the deduction of physical laws. Whether we take a Cartesian atomism, a Democritean atomism, a Newtonian point-force system, or an Aristotelian hylomorphism, where the physical laws "agree with" (i. e., do not contradict) these theories, the laws neither prove, explain, nor follow from them. With this the scholastic must agree, or else deny the essential contingency of the world. Duhem would be appalled by any real elimination of true metaphysics from physics. He would never have dreamed of forgetting that *actiones sunt suppositorum* or that *operatio sequitur esse*. He would have regarded these items not as *metaphysics* but as things that any fool knows are true of everything.

Again, when Duhem says "primary quality" he doesn't mean figure, motion, and size, but rather ultimate simple particle. But besides the language difficulty, there is the fact that he goes well beyond the Sunday-supplement level of writing. For example, Duhem was forcefully struck by the impossibility of asserting the truth of a theory on the ground that some consequences of it obtain. In logic we are all used to agreeing that asserting the consequent is a fallacy. Even if we find increasing fossil specialization in paleontology, we do not have a conclusive proof that Darwin was right. But it takes a bit of seeing—"insight," Lonergan calls it—to understand that in physics this simple fallacy can be made in several ways. We must remember that "An experiment in physics can never condemn an isolated hypothesis but only a whole theoretical group," and that, "A crucial experiment is impossible in physics." Duhem, in illustrating these propositions writes:

> Let us take as an example the experiment imagined by Zenker and carried out by O. Wiener. In order to predict the formation of bands in certain circumstances and to show that these did not appear, Wiener did not make use merely of the famous proposition of F. E. Neumann, the proposition which he wished to refute; he did not merely admit that in a polarized ray vibrations are parallel to the plane of polarization; but he used, besides this, propositions, laws, and hypotheses constituting the optics commonly accepted [here he lists many of them]. By joining these propositions . . . to Neumann's proposition, Wiener was able to formulate a forecast and establish that the experiment belied it. [However] nothing stops us from taking Neumann's proposition as accurate and shifting the weight of the experimental contradiction to some other proposition of the commonly accepted optics; as H. Poincaré has shown, we can very easily rescue Neumann's hypothesis from the grip of Wiener's experiment on the condition that we abandon in exchange the hypothesis which takes the mean kinetic energy as the measure of the light intensity; we may, without being contradicted by the experiment, let the vibration be parallel to the

plane of polarization, provided that we measure the light intensity by the mean potential energy of the medium deforming the vibratory motion.

The level of writing may discourage many who feel that their last course in optics is too far behind them for comfortable understanding. But such an attitude is uncalled-for. Even though we cannot judge whether Duhem and Poincaré are right in their criticism of Wiener and Zenker, or how dated the optics discussed have become, we can see that Duhem and Poincaré are right *en principe,* whether or not their particular physics is correct.

When Duhem calls himself a positivist he certainly is not a positivist as was Mach for whom intellectual economy was the sole aim of physical theory. For Duhem asserts that (a) intellectual economy, (b) classification, and finally as a limiting form (c) *natural* classification are the aims of physical theory. Hence in epistemology he can not be either a nominalist (an empiricist) or a conceptualist (an idealist). And his "pragmatism" is epistemologically harmless since it is confined to the provisional acceptance as "good" of theories which are classificatory but not *naturally* classificatory.

Duhem also does some odd things. He likes Pascal for his philosophy. He contrasts Gallic depth with Anglican breadth. He goes to great lengths to prove that a theist can be a good physicist. He sometimes says that we must "postulate" the real. He inveighs overlong against the fantastic models of 19th century British physics. He turns down the chair of the history of science at the Collège de France on the grounds that he is really a physicist. Without doubt he was both, but what he will probably be remembered for are his reflections on the philosophy of science.

As I read along I never thought of the work as a translation. Wiener's clear, unaffected prose style is a pleasure. His own scholarship is quietly interpolated in erudite translator's notes, and his humanity pleasantly emerges in cross references to more available books, often on my own shelf.

CORNELIUS RYAN FAY

Chestnut Hill College,
Philadelphia, Penna.

***De Puritate Artis Logicae Tractatus Longior* (with a revised edition of the *Tractatus Brevior*). By Walter Burleigh. Edited by Philotheus Boehner, O. F. M., Ph. D. St. Bonaventure, N. Y.: The Franciscan Institute, 1955. Pp. xvi + 264, with index.**

This should surely be a set text in any institution where it can be assumed that students of logic are able to read Latin. The Latin is so easy; the man's problems and interests are modern enough to hold the twentieth-century reader's attention, and his methods medieval enough to teach us something unfamiliar; and I do not know any other medieval logic book in which you have to wade through as little dross to find as much pure gold.

The first part of the *Tractatus Longior* is on supposition, which Burleigh divides into material, simple and personal. He says that when a term has *suppositio simplex*, as with "man" in "Man is a species," the term stands for what it primarily signifies. To the nominalist argument that what "man" primarily signifies is "this man and that man" he replies that if this were so we could not know what "man" meant without knowing what men there were, and the word would change its meaning every time a man died. Similarly the meaning of "thing-at-rest" would change every time we waggled our finger or stopped waggling it. His whole polemic here (pp. 7-9) is very shattering.

Personal supposition, where a term really does stand for individuals, is divided (pp. 20-21) into (1) determinate, as "man" in "Some man runs," where the proposition in which the term occurs is true if and only if at least one of the propositions in which the term is replaced by a singular falling under it is true; (2) confused and distributive, as "man" in "Every man runs," where the proposition is true if and only if *all* the corresponding singulars are; and (3) merely confused, as "animal" in "Every man is an animal," where the proposition would follow from any of the corresponding singulars ("Every man is this animal," etc.) but does not imply that any of these singuars is true, still less that all of them are. Certain fallacies involving double quantification, of the type of "Every man is some animal, therefore some animal is every man," are condemned as involving a passage from some term (in the example, "animal") in merely confused to the same in determinate supposition (pp. 23-4; 35); conversion *per accidens* being validated by a proviso (p. 23). In between merely confused and distributive supposition is the "singulated" confused and distributive supposition of a term like "himself" in "Every man sees himself."

We cannot pass to this from "Every man sees Socrates," as we could if "himself" stood for men merely confusedly; or *vice versa,* as we could if it stood for them distributively; but we can pass from "Every man sees himself" to "Socrates sees Socrates" (p. 31).

In handling another class of fallacies involving double quantification, of the type, "In every pair of contradictories one number is true, and 'You are a donkey' is one member of a pair of contradictories, therefore 'You are a donkey' is true," Burleigh distinguishes (Russell-wise) between the *subiectum quoad logicum* and the *subiectum quoad grammaticum* (p. 41). It is not under the latter but under the former that the minor must be subsumed in a perfect syllogism; and in the given case it is not the *terminus rectus* but the *terminus obliquus,* "pair of contradictories," which comes first and is the logical subject, so the legitimate syllogism is not the above but rather "In every pair of contradictories one member is true, and 'You are a donkey' and 'You are not' form a pair of contradictories, therefore one of these is true" (p. 42).

In a chapter on *appellatio* the distinction between the *significatio* of a common term and its individual *supposita* takes on a new aspect, and we see how "predicative" a common term remains even when it is grammatically subject. For there may be an implicit modal or temporal qualification of the subject which is independent of that of the predicate, as when we say "The white could be black" (or "was black" or "will be black"). This does not mean that it could be that the white is black, for that can never be, but that an individual *suppositum* which is in fact white could be black, and it is only of such individual *supposita* that we can lay it down that they could be black if and only if it could be that they are (pp. 48-49).

The second major portion of the *Tractatus Longior,* on hypothetical (i. e. compound) propositions and syllogisms, maintains the quality of the first. Among other things, Burleigh very competently tidies up Boethius on pure hypothetical syllogisms. Boethius follows Theophrastus in dividing these into three figures, a typical Figure 1 example being "If p then q, and if q then r, therefore if p then r"; Figure 2, "If p then q, and if not p then r, therefore if not q then r"; Figure 3, "If p then r, and if q then not r, therefore if p then not q." Burleigh says rightly (p. 94) that it is Boethius' Figure 3 (with the common part r at the consequent end of both premisses) that is really like Figure 2 in categoricals, and so reverses the nomenclature. (My own

view is that Theophrastus was led astray by the Aristotelian habit of stating the predicate first and the subject last, "P is predicated of all S" and so on; this made him treat the consequent of a hypothetical, absurdly, as the counterpart of a categorical subject). And under Figure 3 Burleigh puts not only the Theophrastean-Boethian Figure 2, but also (pp. 102-3) a type of inference much more like Figure 3 in categoricals, involving negated conditions rather than conditionals with negated antecedents; for example, "If p then q, but not (if p then r), therefore not (if q then r)."

As other illustrations of Burleigh's formal skill, I might cite his systematic discussion of syllogisms using "exclusives" (pp. 149-164)—a most de Morgan-like enterprise—and his account of the qualifications to be put on the maxim that when Y follows from X, X with a preceding sign of distribution follows from Y similarly distributed, e.g. since "An animal is running" follows from "A man is running," "Every man is running" follows from "Every animal is running" (pp. 84-5; 211-2). (Readers attempting to put the principle of this into Łukasiewicz-type symbolism may be warned against making it *CCIacIbcCAbcAac*, which is false if all *b* and some but not all *a* are *c*; the formula required is rather CΠcCIacIbcΠcCAbcAac). Then there is his proof of the rule that any proposition implying both of two contradictories (as, e.g., "You know that you are a stone" implies both that you are a stone, for you can only know what is true, and that you are not a stone, for stones cannot know anything) implies its own contradictory. For suppose p to imply both q and not q; since p implies q, not q implies not p, but *ex hypothesi* p implies not q, i.e., implies what implies not p, and so implies not p (pp. 70-1).

After this last example Burleigh lists a chorus of objections;—and how familiar this chorus is! Conditionals with opposite consequents are opposites, and cannot both be true; a proposition cannot imply its contradictory, for it cannot have anything in common with its contradictory to constitute the *ratio* of this implication; and so on (p. 72). Answering the first, Burleigh shows from the Aristotelian principle that in a pair of contradictories what is principally affirmed in one is denied in the other, that the contradictory of "If p then q" is not "If p then not q" but "Not (if p then q)"; for what is principally affirmed in the former is not q but q's implication by p (p. 73). He deals as faithfully with the other objections, and it is an education in the philosophy of logic to watch him doing it.

The same uncompromisingly formal point of view emerges in his discussion of certain reasonings involving disjunctives (p. 119). It is a sound rule that if *p* implies *q*, then *p*-or-*r* implies *q*-or-*r*, and *r*-or-*p* implies *r*-or-*q*. But there are some odd special cases. Since "Plato is running" implies "A man is running," "Socrates is running or Plato is running" implies "Socrates is running or a man is running"; and since "Socrates is running" implies "A man is running," "Socrates is running or a man is running" implies "A man is running or a man is running." In its form this conclusion is "improper" (even though the disjunction be only weak, i. e., not excluding the truth of both parts—an interpretation of "or" for which Burleigh argues powerfully elsewhere) (pp. 115-6). "It can however be said," he continues, "that the impropriety in the expression does not prevent either its truth or its following (from the given premiss)." In these days when many philosophers dismiss as meaningless anything that would sound peculiar if brought up in ordinary polite conversation, it is heartening to learn that logicians had to suffer from these people in the middle ages too, and that at least this one stood his ground.

The only fault I would find with the editing is that as so much of the argument, especially on *suppositio materialis*, depends on the medieval absence of quotation marks, I doubt whether it was wise to put them in; it should in any case have been done properly if at all, and not as, e. g., on p. 128, line 34. And on p. 5, end of line 35, the sense clearly requires *Si categorematice* rather than *Si syncategorematice*.

A. N. Prior

Canterbury University College,
Christchurch, New Zealand

Summa Theologiae. By Saint Thomas Aquinas. Cura et studio Instituti Studiorum Mediaevalium Ottaviensis. Second and revised edition of Volume I-IV. Ottawa: Commissio Piana, 1953. Five Volumes. Pp. 3089 + 525, with indices. $24.00.

The Ottawa edition of the *Summa Theologiae* received much well-deserved praise when it first appeared (1941-46). The war, in isolating Europe, cut off the source of supply, and the new world, to have an edition of the *Summa*, had to produce one of its own. But what was in origin a hardship proved an occasion for triumph. The new edition

turned out to be better in many ways than any of the editions formerly available.

There was no question of providing a truly critical text; in the situation it was impossible, and, even if possible, it would be a work of years, if not of generations. The editors did the next best thing and decided to reprint the best text available, that of the Piana edition, with the more important variant readings of the Leonine edition in footnotes. But they also decided to try something never attempted before, nothing less than that of identifying all the references St. Thomas makes, not only those actually named, but also those cited only by a quidam. For this a team of fifty-five scholars was organized. The result is a work of historical scholarship unique among the editions of the *Summa*. Furthermore, the references to the more standard authorities, such as Aristotle and Augustine, were checked and cited according to the best editions. Thus it is now possible, by looking to the bottom of the page, to locate the source of the great multiplicity of references that St. Thomas makes in the course of his work. To make it still better, a table is provided at the beginning of each volume of the authors cited or referred to by St. Thomas with bibliographical information for locating the citation in the best edition.

The edition also has made an improvement in placing the article on the page so as to make more apparent its dialectical structure. The *sic proceditur* is separated from the statement of the first position. The *respondeo dicendum* is separated so that the first word stands by itself, thus indicating that the master is here beginning his determination of the question, and the *dicendum* begins a new sentence giving this determination. These are small matters, perhaps, but they assist in showing that the *Summa* is fully in the tradition of the disputation.

With their attention to detail, I only wish the editors had gone one step further and indicated by a change of type or by quotation marks the many places where St. Thomas talks about his language. With our contemporary concern about the difference between object-language and meta-language, it would be useful to recognize that St. Thomas in his way shares in the same concern.

A word should also be said about the format. Although not as small and handy as some editions, this is still one that can be held comfortably in the hand. The type, although in double columns, is extremely readable. The paper is strong, white, and like the canvas binding is obviously made to last.

All these are virtues of the first edition. They have been retained in the second and still new ones added. The entire text, including notes and bibliography, has been reviewed and improved, typographical errors have been corrected, and a better quality paper has been used.

The set is divided as follows: Vol. I. *Prima Pars,* pp. I-LXIV, 1-709, 1*-18*, $5.00; Vol. II. *Prima Secundae,* pp. I-XL, 710-1399, 1*-19*, $4.50; Vol. III *Secunda Secundae,* pp. XLVIII, 1400-2412, 1*-28*, $5.00; Vol. IV. *Tertia Pars,* pp. LXVIII, 2413-3089, 1*-16*, $5.00; Vol. V. *Supplementum Tertiae Partis,* pp. XLIV, 2*-525*, 1-16, $3.50. The fifth volume will be supplied in the first edition until the stock is exhausted.

All things considered, this Ottawa edition of the *Summa* is certainly the best to have and to hold and to use.

OTTO BIRD

University of Notre Dame,
Notre Dame, Indiana

Writings of Edith Stein. **Edited by Hilde Graef. Westminister, Md.: The Newman Press, 1956. Pp. 206, with index. $3.75.**

Miss Graef has selected and translated several essays by Edith Stein and some passages from her philosophical work. The essays deal mostly with matters only indirectly related to philosophy; three are purely spiritual, two are on mystical theology, three deal with education, and only the last two selections are taken from philosophical works. Edith Stein's voluminous treatise on *Eternal and Finite Being* has been presented before; the two pages contained in the present book can hardly convey to the reader an idea of the original. The other philosophical text is taken from an article published in Husserl's *Jahrbuch*, "Contributions to a Philosophical Foundation of Psychology"; in consequence of its fragmentary character, it does not make clear the author's position. These two selections may, perhaps, arouse the curiosity of the reader but certainly not make him realize the philosophical position of the author. Nor will it prove to be of great help to read the few words Miss Graef says on Edith Stein's significance as a philosopher in the 11 pages of her introduction.

There is a brief comment, on p. 17, on the fact that Edith Stein did not take account of psychoanalysis, in either her educational or her philosophical works. The editor correctly points out that this neglect

is owed to the essentially philosophical and phenomenological approach prevailing throughout the work of the author. It might have been added that phenomenology—whether of Husserl or of another kind—is concerned with the phenomena as they are given to immediate inspection and, therefore, has little to gain from studies of a genetic nature. The phenomenon tells us what there is but not whence it stems.

Although one may agree with Miss Graef that the attempt of Edith Stein at achieving a synthesis of traditional and modern philosophy may prove stimulating and be deserving of further consideration, it is not from this book that one will learn what the aim of this synthesis truly is. The book may well prove of value by its spiritual tendencies and as a contribution to educational theory; the philosopher, however, will have to turn to the original works.

RUDOLF ALLERS

Georgetown University,
Washington, D. C.

Language and the Pursuit of Truth. **By John Wilson. Cambridge, England: The University Press, 1956. Pp. 105. $1.75.**

It is an old scholastic custom to study linguistic communication and to analyze language from the standpoint of logic. Medieval treatises abound in the field, and one of the severe limitations unnecessarily imposed upon themselves by twentieth century semanticists is their lack of acquaintance with the literature of the middle ages devoted to the study of the arts of logic and language. For that matter, the ancient Greeks had a few words to say on the matter, especially Plato and Aristotle. Most contemporary semanticists, chiefly those of a positivistic persuasion, give the impression that careful analysis of signs and symbols arose only in contemporary times. The fact that many of the important medieval treatises are not readily available and are not translated is an extenuating circumstance; nevertheless, the widespread omission of reference to them is an appalling commentary on the provincial character of much of contemporary thought.

It might be unfair to say that Wilson is one of the typical twentieth century semanticist's who knows little or nothing of the extensive history of thought on the study of language and logic. His book aims "to present semantics, which is the study of linguistic communication, to the general public." There is no occasion for referring explicitly to the

contributions of other periods to achieve the immediate aim of the book, the laudable one of stirring the general public to the need of employing language carefully and skillfully in order to arrive at truth. It is not unreasonable to presume, however, that in writing a book even so restricted in aim, an author would draw upon the rich resources of semantic literature in all periods of thought. Wilson suffers from no embarrassment of riches in this respect, and the narrowness of his approach and outlook suggests that his background is scanty indeed.

There are, nevertheless, some highly commendable features of the book. First, and by no means least in importance, the book is written with clarity and precision. The reader and the author can come quickly to terms, for the author knows precisely what he wishes to establish and he uses economical means of expression to achieve his purpose of making a semantic analysis intelligible to non-professionals. Ironically, writers on semantics are not usually distinguished by clarity and a business-like style.

The ordering of the book is good. The reader moves from an analysis of words and their different types to a similar treatment of statements. Only when words and statements have been analyzed can the full problem of determining truth be faced and resolved, and the author makes this matter his concluding chapter. Throughout the middle and concluding chapters, the author's explanation of the method of verification and its use within a restricted area is clear and consistent.

The drawbacks of the book are many, but only a few can be indicated. (There are even errors: for example, errors of fact, such as, before Galileo it was held that the earth was flat; and errors of analysis, such as, metaphysics is supernatural). The most glaring defect of the book is the narrowness of the author's outlook, particularly in his wholly univocal and restricted approach to the meaning of verification and truth. The latter is confined to the procedure of experimental science, for although at times the author is willing to allow for differences in method of verification and in kinds of experience, he is clearly at a loss how to analyze and make intelligible the sort of verification and experience that would be pertinent in metaphysical, moral, or poetic discourse. He invariably slips back into viewing and judging all types of knowledge and communication from the standpoint of experiental scientific discourse, and herein lies the narrowness of his outlook and comprehension.

This defect seems to rest principally upon a basic ignorance of other

types of knowledge. Poetic communication, for example, reduces wholly to an arousal of feeling in so barren a fashion that groans and metaphors would have no distinguishable difference. Wilson seems to be completely unaware of the type of knowledge and truth that is proper to the poetic order. He remarks: "Pure poetry is one thing; nobody 'takes it seriously.' Pure prose, such as a scientific text-book is another; nobody feels inclined to read it in the sing-song, faintly mystical voice which we reserve for poetry" (p. 49). It may be safely concluded that the poetic order of knowledge is not an area in which Wilson speaks with competence.

The consideration of value statements is almost equally vapid. The same narrowness is present: ". . . only a scientific approach to our problems of value can help to solve them," where by "scientific approach" he means, first, the "absence of prejudice and open-mindedness which characterizes the work of a good scientist; and secondly, the operation of the scientific method of observation, experiment and hypothesis" (pp. 91-92). No one quarrels with the employment of the scientific approach so described wherever relevant, though it may be presumed that lack of prejudice and open-mindedness are characteristics not wholly alien to minds other than those of scientists. But the unrestricted application to every field of human endeavor of one meaning of scientific approach precludes any fruitful analysis of the semantic problems and type of experience proper to social and moral discourse. Apparently the author is quite unaware of the distinction between practical discourse and its appropriate methodology, as in moral science, and theoretical discourse with its appropriate methodology, as in mathematics or experimental science.

The shallowness of the author's approach shows up most of all in his treatment of metaphysical statements and metaphysical knowledge. In much too light an air, he defines metaphysical statements as those "about whose meaning and method of verification we are not agreed, or which (so far as we can see) seem to have no meaning or method of verification at all" (p. 70). What he means by metaphysics itself may be gathered from the following observation: "'Metaphysics' means literally 'post-physical': and the statements of metaphysics are supposed to inform us about a world which is not the ordinary physical world, but some supernatural region which exists above the world of nature" (p. 71). He offers the following as typical metaphysical statements: "There are men on Mars," and "God will save the righteous."

The foregoing quotations are sufficient to disqualify him unreservedly as competent to discuss meaning and truth in metaphysics. It is unfortunate that Wilson knows nothing of metaphysics, for I think it is evident that semantic problems are particularly acute in this area of knowledge. I think that a good case can be made for the point that metaphysicians have opened themselves up more than anyone else to the charge of semantic confusion. The intrinsic difficulty of the subject matter is undoubtedly an occasion for this frequent unhappy occurrence. But in dealing with this problem, one does have to know what metaphysics is all about and how it has developed in the history of thought from the time of the ancient Greeks. No solution can be found by one who writes about metaphysical discourse out of sheer ignorance as to what its subject matter is and who is unable even to cite typical metaphysical statements. Presuming some knowledge of metaphysics, the solution lies in recognizing that there is a methodology and type of verification proper to metaphysics distinct from, for example, experimental science, and then analyzing the semantic problems peculiar to metaphysics. Wilson throws no light on this important problem because he is unaware of its existence.

What value Wilson's book has lies in a restricted area of human knowledge and experience. It is clear that he does not understand or appreciate poetic, moral, and metaphysical discourse. This being the case, either he should have eliminated these considerations from his book or, for the sake of the general public for which he is writing, he should have become informed about the semantic dimensions of these areas of human knowledge and experience.

JOHN A. OESTERLE

University of Notre Dame,
Notre Dame, Indiana.

Philosophical Papers and Letters. **By Gottfried Wilhelm von Leibniz. Translated and Edited by Leroy E. Loemker. Chicago: The University of Chicago Press, 1956. Two volumes. Pp. x + 1228, with index. $12.00.**

During the past fifty years, interest in the writings of Gottfried Leibniz has increased considerably, and even such diverse figures as Maurice Blondel and Bertrand Russell have found a peculiar fascination in the works of this strange figure of the late Renaissance whose restless

mind could calmly move from calculus to metaphysics, and from the mysteries of the Transubstantiation to new methods of removing water from flooded metal mines. In these two admirable volumes, Loemker has gathered together some seventy philosophical papers and essays of Leibniz—many of them previously untranslated—and has furnished the student an easier insight into what was certainly one of the most remarkable minds of seventeenth century Europe.

Loemker prefaces his translations with a long but useful introduction in which he attempts and nicely succeeds in drawing the main lines of Leibniz's life and thought. Aside from a brief but boring reference to the "compromises and strategy of the Jesuits" (p. 4) and a few remarks implying that Leibniz's respect for Aristotle and the scholastics (pp. 27 and 33) hampered his philosophical progress—a conviction not shared by Leibniz himself—Loemker's preface gives an objective and dispassionate account. To the preface is appended an excellent, selected bibliography.

The first volume, covering the years 1666 to 1687, contains a wide variety of selections from works such as "The Dissertation on the Art of Combinations" and the early dialogues on morality, as well as some of Leibniz's shorter theological writings, translated and reproduced in their entirety. The "Discourse on Metaphysics" (1686) also appears; and although Leibniz himself always considered this brief essay as an inadequate expression of his views, still it is a remarkable summary of some of his basic philosophical and theological convictions.

The letters of Leibniz which Loemker has re-printed in the first volume have been carefully selected, and the preliminary notations which appear before each of them are extremely helpful. The letter to Thomasius is an invaluable aid in understanding the "young" Leibniz and in anticipating his later development. His letter to Thomas Hobbes, written by Leibniz when Hobbes was past his eightieth year, includes the lyrical tribute, "No one has philosophized more exactly, clearly, and elegantly than you"—a judgment which Leibniz lived to correct and undoubtedly regret. But, Loemker has included no letter which does not in some way shed more light upon the thought and character of Leibniz and his correspondents.

Volume II is divided into two parts: the first covers the years extending from 1690 to 1698, the second covers the final years from 1699 to 1716. Here again, through the letters judiciously selected by the editor, we catch more than an occasional glimpse of the gentle-minded humanist

that Leibniz always remained, despite the cold rigor of his writings and the occasional outbursts that characterized his controversies especially at the end of his life. "Justice is nothing but the charity of the wise man" (Letter to Arnauld, p. 600); "When a new book reaches me, I search for what I can learn, not for what I can criticize in it" (Letter to G. Wagner, p. 768); "You forgot to give me the name of the Poitevin gentleman, the great gambler who thought of this application of mathematics. Most games could in fact give occasion for sound thinking, and I should like to have his views" (Letter to Des Billetes, p. 771); "Provided that something of importance is achieved, I am indifferent whether it is done in Germany or in France, for I seek the good of mankind. I am neither a phil-Hellene nor a philo-Roman but a phil-anthopos" (*Ibid.*, p. 775).

Loemker also includes in this second volume Leibniz's critical notes on Descartes' *Principia philosophiae*—extremely important for an understanding of the positions Leibniz took in his later writings—and some interesting excerpts from the legal and ethical writings composed just before 1700. "The Correction of Metaphysics," "*Specimen Dynamicum*," and "A New System" also appear; and Loemker has wisely reproduced the correspondence between Leibniz and the English theologian Samuel Clarke (1675-1729) in which Clarke's clumsy attempts to bolster up a tottering theology are no less remarkable than Leibniz's outraged and sometimes non-pertinent replies. Only a portion of the *Monadology* appears; but this work is, of course, readily available in other collections of Leibniz's works.

The translations are accurate and even. The index, which appears at the end of volume two, is somewhat incomplete but still serviceable. The notes, however, found at the end of each volume, are extremely valuable. There are a few spelling mistakes and occasional defects in composition (e. g., the right-hand margins are sometimes needlessly ragged); but by and large the two volumes are an admirable example of the careful work which the Chicago University Press has been publishing in its current series of significant philosophical writings.

R. W. Mulligan, S. J.

Loyola University,
Chicago, Illinois.

The Reality of Substance. **By Rev. Robert E. McCall, S.S.J. Washington: Catholic University of America Press, 1956. Pp. xiv + 202, with index. $2.25.**

The Reality of Substance is a doctoral dissertation submitted to the School of Philosophy of the Catholic University of America. The subject of this thesis has been a source of endless controversies among philosophers throughout the history of thought. Fr. McCall attempts, and I believe, succeeds in giving us a clear exposé of a difficult problem, together with an intelligible approach to a solution.

The problem of substance can be examined from three points of vantage: existence, knowability, and nature. Accordingly, the author asks these questions: Does substance exist? Can we, and how do we, know substance? What is the nature of substance? These three aspects of the same problem constitute the more significant part of the work; they occupy chapters three, four, and five respectively.

Before expounding his views on these three questions, Fr. McCall brings to bear an acute criticism upon the erroneous opinions of those philosophers who, in some manner, impugn the reality of substance. In chapter one, the factors which caused the rejection of substance by these thinkers are examined and analyzed. The author, in the second chapter, shows that the rejection of the reality of substance is largely due to a faulty theory of knowledge. He proceeds then to unfold St. Thomas's doctrine, giving considerable attention to the interpretations proposed by Cajetan and John of St. Thomas. Fr. McCall felicitously points out that an epistemological error is generally a necessary by-product flowing from a misconception of the true nature of man. We heartily concur with this illuminating statement; indeed, we would like to assert that practically all philosophical dead-ends are connected with some error regarding man's nature.

A brief conclusion defines and summarizes the various chapters of the book. A bibliography and an index follow.

We congratulate Fr. McCall on this—to my knowledge—his first important contribution in the field of philosophy. *The Reality of Substance* should prove a distinct help to students in their endeavor to grasp the fundamental problems of thought and of the existent. While one may not give absolute endorsement to every inference drawn by the author, the great truths which should found and direct man's correct thinking in his search for the real are established in a clear,

convincing, and at times in an impressive manner. The book is well worth reading and studying.

There are, of course, minor matters which present some difficulties. I should like to mention one of these which is connected with the proof for the existence of substance. This appears in the third chapter, beginning on page 50.

The proof of the existence of substance, explains the author, lies in the impossibility of an infinite regression in the line of accidental realities. This argument, everyone knows, is found in many scholastic text-books. Fr. McCall attributes it also to St. Thomas, and on page 53, to bolster his contention, cites a text taken from the *Commentary of the Metaphysics*. Now, I am not too sure that the text in question connects in any way with a demonstration for the existence of substance. In this passage St. Thomas explains that there are two modes of predicating an accident. One is had when the accidental perfection is attributed directly (immediately) to the subject (*sicut Socrates est musicus*). The other is had when it is predicated *per accidens* of another (*sicut album praedicatur de musico*). In neither of these types of predication, St. Thomas affirms, can an infinite regression be had. As to the first type of predication, this, of course, seems evident enough. The problem is more acute, however, as regards a *per accidens* attribution of one accident to another. Now the reason for Aquinas's assertion that even in the *per accidens* predication an infinite regression cannot be had is certainly not because an infinite regression of accidental causal nexus is impossible. Quite the contrary! St. Thomas has always vigorously stated that such an impossibility cannot be demonstrated, and there is nothing in the present text which suggests a reversal of his opinion. What reason, then, is offered by the Angelic Doctor to show that the "*praedicatio in infinitum*" is not to be thought of (*non contingit*)? The reason is simply that either predication is that of an accident. For we cannot effect this predication of an accident without an implicit understanding of substance, because ". . . ambo accidunt subjecti." Indeed, the *ratio*, the intelligibility of accident always implies substance. That is to say, whether it comes (*accidit*) to the subject immediately or indirectly in our predication, the *ratio* of an accident is meaningless without the substance to which it comes (*accidit*). For the term of a "becoming" without a subject which becomes is a plain contradiction. (cf. *In II Phys.*, 1, n. 8.)

From the cited text of the *Metaphysics*, it would seem that the

inference to be drawn is that the understanding of the existing reality which we call substance is had through an analysis based upon an experience of the existent, rather than through a formal demonstration founded upon the impossibility of an infinite regression in accidental dependence. Indeed, I am inclined to think that Fr. McCall is not really opposed to this view, for he states definitely (p. 189) that: "the intellectual penetration of the intrinsic character of substance is a gradual process from implicit to explicit."

This and other minor points are controversial matters. *The Reality of Substance* is a valuable work which we hope will be followed by many others.

HENRI RENARD, S. J.

The Creighton University,
Omaha, Nebraska.

Essays in Conceptual Analysis. **Selected and edited by Antony Flew. New York: St. Martin's Press Inc., 1956. Pp. xi + 265. $4.25.**

An invitation to "take a look into the workshop to see the sort of things the philosophers are doing nowadays" is extended by Antony Flew to the prospective reader who, whether professionally concerned with philosophy or not, may wish to examine and possibly discuss some important articles in analytical philosophy. These twelve reprints from *Mind, Proceedings of the Aristotelian Society* and four other journals (1945-55) provide a variety of contributions by nine men and two women who practice the currently fashionable analytical method.

"All the subjects treated fall within the field covered by Oxford 'Logic' examination papers: morals, politics, aesthetics, the philosophy of science and of religion have thus been excluded" (p. vii). Flew's "Philosophy and Language" (pp. 1-20), originally commissioned by the Philosophical Quarterly as a cross between an *apologia* and a ten-year survey of work in this *genre,* serves as a first chapter of explanations; and in its somewhat revised form, sets the rather soft polemical tone for the anthology. There is no distracting editorial commentary through the book, but judicious use of footnotes establishes contact with the *avant-garde* of Oxford philosophy since the war—"Austin, Hart, Hare and Urmson, for instance"—anticipates the capstone chapter six by

J. O. Urmson, and S. E. Toulmin's important "Probability" (pp. 157-191), and also provides continuity with similar collections edited by Flew and published earlier.

In the present volume Toulmin, Urmson and others acknowledge the considerable influence of J. L. Austin's "Other Minds" reprinted in *Logic and Language,* second series, 1953. Toulmin's critical essay considers Kneale's *Probability and Induction,* and develops a position in general agreement with Urmson and with P. F. Strawson. Most of the papers have been reprinted here without substantial alteration or excision. Throughout the book there is evidence of the influence of G. E. Moore and the later Wittgenstein, signs of the group's decisive break with Russell and implied general opposition to science-orientated logical analysis and the over-emphasis on the philosophic value of techniques of symbolic logic as found in Carnap, Reichenbach, Quine and others in the United States. The Oxford philosophers who follow the various policies for which Gilbert Ryle argued in his "Ordinary Language"—reprinted in *Logic and Language,* first series, 1951—"may be thought of as trying to preserve a balance between this 'formalizer's dream' that non-formalized language really is, or ought to be replaced by, a calculus; and the Humpty Dumpty nightmare that there is, at least in those parts of it which most concern philosophers, no logic or order at all" (p. 18). A slight reverberation of Moore's interest in metaphysics back in 1910 at Cambridge may still be felt by those active at Oxford in 1950-55, but G. J. Warnock's extensively revised "Metaphysics in Logic" (pp. 75-93) is more a case of stalking Plato's ghost in the spirit of Wittgenstein's insistence of clarification of problems and the elimination of metaphysical perplexity as the task of philosophy. This is to be accomplished by a scrupulous use of ordinary language in the settlement of the issue of nominalism versus Platonic realism; and the argument against Quine is that "the efforts of the logician to clarify problems of ontology fail, since the devices employed all turn on notions of quantificational logic, particularly on the use of bound variables and the existential quantifier, which apparatus "has little or no clear application to the ordinary words and idioms in which the problems are initially expressed" (p. 91). And, "if one cannot deal with philosophical problems of ontology upon the field of discourse in general, one . . . can only pass them by" (p. 92). This is precisely what Warnock does in refusing to make the ontological commitment himself.

There is similar common ground between scholastic supposition theory and P. F. Strawson's "On Referring" (pp. 21-52); and here is successful criticism of Russell's Theory of Descriptions with its postulation of a world of strange entities in order to answer logical puzzles about the existence of the king of France. Wittgenstein's famous slogan "Don't ask for the *meaning*, ask for the *use*" in the early thirties at Cambridge becomes in Strawson's analysis: ". . . the meaning of an expression is not the set of things or the single thing it may correctly be used to refer to: the meaning is the set of rules, habits, conventions for its use in referring" (p. 32). Similarly, "to give the meaning of a sentence is to give *general directions* for its use in making true or false assertions. . . . For to talk about the meaning of an expression or sentence is not to talk about its use on a particular occasion, but about the rules, habits, conventions governing its correct use, on all occasions, to refer or to assert" (pp. 30-31). Strawson further notes that the preoccupation of some logicians with formal systems, as in the case of Leibniz and Russell, gets them into special difficulties—the bogus dilemma concerning abandonment of traditional laws in the square of opposition and some forms of the syllogism traditionally recognized as valid, results from a failure to see that problems of use are wider than problems of analysis and meaning. Flew notes (p. 10) that the explicit concern with correct *usage* as the determinant of *use* seems to derive mainly from Austin.

It seems that the ladies have been reading Wittgenstein, too. Honor Brotman's (Mrs. Stamler) interesting exploratory piece, "Could Space be Four Dimensional?" (pp. 253-265) is probably traceable to a passage (No. 74) in the *Philosophical Investigations*, but her four-dimensional cube involves an interesting bit of imagination for its interpretation. Edna Daitz (Mrs. O'Shaughnessy) in "The Picture Theory of Meaning" (pp. 53-74) draws examples from John Wisdom, Russell and Wittgenstein's *Tractatus*; and distinguishes iconic and conventional modes of signification to bring out a *misdescription* of language where the sentence is interpreted on the picture model. Sentences are conventional signs, not natural signs.

A revised version of "What is Explanation?" by John Hospers, which was originally published in the *Journal of Philosophy*, 1946, treats "explaining *why*," and then appends some comments and arguments to support the position that deducibility is not a sufficient condition of explanation. But the master craftsman in this shop of the

analysts is J. O. Urmson, whose piece on "Some Questions Concerning Validity" (pp. 120-133) is performed so well that he returns for an encore, "On Parenthetical Verbs" (pp. 192-212). These special verbs are important "because they include such philosophical war-horses as *know, believe,* and *deduce*" (p. 211). Though in a different class than Austin's performatory verbs, the two types have much in common as against ordinary descriptive verbs. In the principal article Urmson uses the distinction between the value proposition and the factual proposition in his critical analysis of mis-statements of the argument from standard examples as applied to the problem of validity in deductive reasoning, inductive reasoning and ethical reasoning. Dangers in such formulations which take "valid" as a logical term of the same type as "disjunctive," for instance, are pointed out. "In the case of deductive argument the higher order question has never, or hardly ever, been formulated in the misleading way: 'Are deductive arguments ever valid,' but in the form 'Why are they counted valid?', and in a spirit of philosophical enquiry. . . . It is the ridiculous way in which the higher order question has been put that has prevented similar sanity with regard to ethics and induction" (p. 131). Essential here is the difference between (1) the criteria for validity of arguments in a given field and (2) the reason why we employ these criteria. Thus, the correct formulation of problems is half the battle. As Flew concluded the introductory chapter (p. 20), "to see the power, and the limitations, of the Argument of the Paradigm Case is to realize how much of common sense can, and how much cannot, be defended against philosophical paradoxes by simple appeal to the ordinary use of words; and why." Peter Herbst on "The Nature of Facts" (pp. 134-156) takes the position that, since "a fact is what a true factual statement states" (p. 150), and both events and states of affairs differ from facts, "the spatio-temporal view of facts should be abandoned . . . because it leads to absurdities in the case of *all* facts" (p. 155).

Included in both this collection and in the 1953 series are J. J. C. Smart and D. F. Pears, in addition to Urmson and Warnock. In "The River of Time" (pp. 213-227), Smart discusses certain properties of events and of time, and brings out a syntactical similarity between our talk about rivers and our talk about time, in his discussion of a metaphor which seems inescapable and also liable to lead us astray; and special problems of usage occur due to shifted syntax in what he calls "philosophical mythology." The esoteric piece by Pears, "Time,

Truth and Inference" (pp. 228-252) is a highly imaginative essay in the grand style of philosophy reminiscent of an early neo-Hegelian period at Cambridge and Oxford. Problems of time and space are traditionally part of philosophy, even when it is philosophy as analytical method. Since Pears can find no acceptable definition of time, he accepts it as a category. Does linguistic analysis and criticism of some views of McTaggart and Bradley strive to get an ultimate view of the interconnectedness of all things, or to transport some synthetic view to a linguistic level? Analytical philosophy, always conscious of method, now seems fully self-conscious in a way that includes its whole history and background.

The methods of the kind of logical analysis of language carried out by the Oxford group in this engaging book seem to have yielded essentially negative results so far as philosophical investigation and position go, but the air is clearer in some instances: the destruction of unnecessary logical puzzles, recognition of facts as phenomena, weak temporal tautologies and rules for the correct use of words. Perhaps realistic philosophy now must view integrally the *designata* of ordinary language-use and the implications of human action and experience in terms of first principles and basic necessities.

PAUL JACOBY

Seton Hill College,
Greensburg, Pennsylvania.

Summary of Scholastic Principles. **By Bernard Wuellner, S. J. Chicago: Loyola University Press, 1956. Pp. viii + 164, with index. $2.00.**

Summary of Scholastic Principles is the second work published recently by Fr. Bernard Wuellner. Like its predecessor this latest volume reflects the author's lifetime devotion to the philosophical advancement of the student. For years Fr. Wuellner has labored over pedagogical techniques to aid the student's grasp of inherently difficult matters. Finally he is bringing to light the effort of all of these years.

In *Summary of Scholastic Principles* Fr. Wuellner has garnered a highly comprehensive number of primary and secondary principles functioning in Thomistic philosophy. Although the title of the work would incline one to believe that in it will be found principles relative

to all of the scholastic syntheses, the Introduction makes it clear that Thomistic scholasticism is the primary source for the vast majority of the principles. From the references it is clear, too, that the works of Aquinas are not the only font. Modern Thomists and their work with primary and secondary principles receive recognition.

The book itself has an interesting organization. After a few introductory words of wise pedagogical advice to the student relative to the grasp and understanding of the principles and to the manner of using the book, the author has grouped the principles under forty-five headings, e. g., Act and potency, Efficient causality, Human acts, Rules on the names of God, Unity, Whole and part. The principles are numbered in sequence throughout the work, irrespective of the categories; a feature which makes for handy reference in the index as well as for cross-reference. At the end of each group-listing will be found references to Aquinas and other scholastic philosophers for the various principles just set forth. A very profitable feature included in many sections is the list of questions or problems. These challenging exercises are calculated to aid the student in understanding and seeing the principles in application over many areas, philosophical and otherwise. (The answers or comments are found at the end of the book.)

Following upon the major section of the book, a lesser section of four supplements has been added. The first supplies an English version of the "Twenty-Four Thomistic Theses." The second is devoted to a presentation of principles relative to Priority and Posteriority and their various types. The next supplement attempts to set forth a list of "basic principles," the "leading ones for explaining, proving, and correlating scholastic views." Finally the fourth supplement is designed to list some principles disputed among the scholastics. It is interesting to note Fr. Wuellner's foci of dispute: a) "Differences in the concept of Being"; b) "Difference in the tests for real distinction in being, and the substitution of formal or modal distinctions for real distinctions"; and c) "the place of the will among the powers of man" (p. 130).

Fr. Wuellner's little book is a very good accomplishment of his intent to facilitate the student's advance toward the deep penetration of philosophy. It is the type of work which has been needed, far superior to an older work of much smaller dimensions. But it is evident that it will in no wise serve its purpose if merely placed in the hands of the student. The teacher himself must be fully aware of its contents and,

no matter what the course being taught, he will have to point out the principles in class and indicate the references to those principles and the correlated ones as they are found in *Summary of Scholastic Principles*. If the teacher is aware of the importance of the principles and, at the end of a section in class, elaborates the principles at work, the student can turn to this book and find great help in it.

There are a few words of regret to be said about this book. Unfortunately the references to Thomas and even to the modern sources are not always clear. For in many instances the passages cited use the principles in an oblique fashion and their use will be obscure to many a student. Too frequently one reference is intended to substantiate three or four principles, references which fail to do this.

The student—and the teacher—will have to approach each principle with a critical attitude for, contrary to the author's statement that the five hundred and sixty-nine listings in the main section are accepted by scholastics, there is room for dispute among some. For example, in the criteria for a real distinction the author writes: "Whatever has properties and attributes that are contradictory or *contrary* to the properties of another being or principle of the same being is really distinct from that other being or principle" (#84, C). Is it true to say that *contrary* attributes are signs of a real distinction in subjects of those attributes? Is there not the principle that "contraries can be in the same subject?" It seems that on the basis of Fr. Wuellner's criterion the will which is the subject of vice cannot be the same as the subject of virtue, for vice and virtue are contraries. For the most part, *Summary of Scholastic Principles* is free of such controversy; still, because of an occasional lapse, the critical approach is very necessary.

This reviewer would go beyond the author and claim that the work is useful for nonscholastics interested in approaching scholasticism. Its usefulness need not be restricted to the classroom of scholastic professors. This book, coupled with the *Dictionary of Scholastic Philosophy* by the same author (reviewed THE NEW SCHOLASTICISM, April 1957, p. 266) would be appropriate companion-volumes for any philosopher's shelf.

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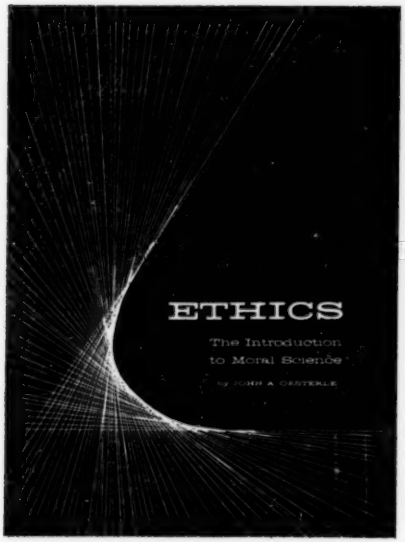

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